



The future of plastics?

Swedish public opinion on plastics policies

KARL HOLMBERG, SARA PERSSON & JOHANNES STRIPPLE

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The future of plastics? Swedish public opinion on plastics policies

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Foreword

This report is the result of cumulative work on behaviour, attitudes, and practices in connection to plastics, in the context of the STEPS research project. This work has involved an assessment of behavioural research on plastics, conducted in 2019, and a more extensive literature review in 2020. Based on insights from this work, the authors identified a gap in the literature concerning the general public's support for current and future plastic policies. The collaboration with the SOM institute to set up a survey was initiated during the fall of 2020, the data collection of survey responses took place in February and March 2021.

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AUTHOR CONTRIBUTION STATEMENT

K.H. and J.S. consolidated the idea and conceptualization of the report. K.H. and J.S. formulated the survey questions. S.P. took the lead in the statistical analysis with the support of K.H. K.H. and S.P. lead the writing of the manuscript with aid and guidance from J.S. All authors provided critical feedback and helped shape the analysis and manuscript.

Disclaimer: The views expressed in this report are the views of the authors and do not represent the opinions of all partners in the STEPS consortium.

Summary

The environmental effects of the widespread use and production of plastic have gained attention in recent years. Plastic pollution in marine environments, and limitations to systems of circularity and recycling, are increasingly recognised as serious global problems in the need of urgent attention. National and international policymaking institutions have therefore started to respond to the challenges of the current use and management of plastic. The European Union has accelerated their work in establishing plastic regulations (e.g., directives on plastic bags and single-use plastics). Policies and governance around plastic are expected to expand in scope, in the EU and elsewhere. But what kinds of policies and regulations have the greatest potential for gaining public support and being effectively implemented? This report examines the Swedish public's opinions on plastic policies using panel survey data. We find that there is relatively high support in Swedish society for a wide range of plastic policies. The greatest approval is found around soft policies e.g., the extension of already established regulations, recycling initiatives, and information campaigns. Regulatory and economic policies, such as taxes, bans, and government regulations, enjoy comparatively less support from the public. This could imply that some of the respondents either do not grasp the scale of the issue, believe that the policies are insufficient, or express unwillingness to change their current unsustainable habits. There are significant differences between demographic groups: women and people on the political left feel more positive about regulatory and economic policies than men and people on the political right. The most widely approved policies are those concerning recycling and waste management system developments. In contrast to other policies that involve economic incentives, the expansion of the deposit-refund scheme stands out as a policy that has very high support across a wide range of groups. Overall, the survey indicates that there is widespread public support for regulation on plastics. To minimise unnecessary polarisation of the issue on the basis of ideology and gender, some discretion is encouraged

in terms of the way more far-reaching changes are presented to the public. The high support for plastic regulation in Sweden in general is encouraging – it indicates favourable conditions for the implementation of a number of plastics-related policies that go beyond the present measures.

MAIN TAKEAWAYS FOR POLICYMAKERS:

- ❖ Do not be afraid to regulate plastics – there is generally broad support for addressing the challenges that arise with the use of this material.
- ❖ Practise incrementalism and learn from best practice examples – begin with soft policies with very high support, but do also communicate a vision of more sustainable plastic use in the near future.
- ❖ There is clear support for an expansion of the deposit-refund scheme. The deposit-refund principle is promising as it indirectly preserves the value of the packaging after its use – Hence an expansion of the scheme could be an effective step forward.
- ❖ Swedes support a tariff on imported fossil-based plastic – the inclusion of petrochemical products in CBAM would likely have the public's support.
- ❖ Ultimately, plastic use is connected to a larger problem with unsustainable consumption practices – efforts to shift consumer habits toward reuse, borrowing and lending consumer items, sharing, and, in some instances, reducing consumption should with time be embraced. Narratives about the future sustainable material use could play an important part in this shift.

Sammanfattning

Miljöeffekterna av den omfattande användningen och produktionen av plast har på senare tid väckt alltmer uppmärksamhet. Plastföroreningar i havsmiljöer, avsaknaden av ett cirkulärt kretslopp och bristande återanvändning av plast är idag välkända globala problem vilka kommer kräva åtgärder. Beslutsfattare har börjat svara på utmaningarna med nuvarande användning och hantering av plast. Europeiska unionen har ökat sitt arbete och flera regleringar av plast har redan etablerats (exempelvis genom direktiv för plastpåsar och engångsplast). Vidare utveckling av policys på plastområdet förväntas inom en närstående framtid, inom EU och på andra håll. Men vilka typer av policys och regleringar har potential att få stöd av allmänheten, och kan i förlängningen effektivt implementeras? I den här rapporten undersöker vi den svenska opinionen kring plastpolicys med hjälp av paneldata. Resultaten visar på ett relativt stort stöd för många av förslagen. Störst stöd finns bland mjuka policys som utvidgning av redan etablerade regleringar, återvinningsinitiativ och informationskampanjer. Strikta regleringar och regleringar med ekonomiska inslag som skatter, förbud och statlig styrning får jämförelsevis lägre stöd i opinionen. Detta kan tolkas som att vissa av de tillfrågade antingen inte förstår problemets omfattning, tycker att förslag är otillräckliga, eller uttrycker ovilja att ändra sina nuvarande ohållbara vanor. Resultaten visar på skillnader mellan grupper av befolkningen där kvinnor och personer till vänster på den politiska skalan är mer positiva till striktare policys och ekonomiska regleringar än män och personer till höger på den politiska skalan. Störst acceptans får förslag som gäller förbättringar av återvinnings- och sophanteringssystemen. Till skillnad från många andra förslag baserade på ekonomiska incitament sticker förslaget om att utveckla nuvarande pantsystem ut som en policy som får generellt mycket högt stöd. Sammantaget visar den svenska opinionen på stor beredvillighet för regleringar av plast. En viss försiktighet och finkänslighet i hur mer långtgående förändringar presenteras för allmänheten uppmuntras för att i den mån som möjligt undvika

onödig polarisering av frågan på basis av ideologi och kön. Den höga beredvilligheten i Sverige är uppmuntrande och bör utnyttjas då det visar på gynnsamma förutsättningar för implementering av en rad förslag inom plastområdet som går utöver de nuvarande åtgärderna.

NYCKELPUNKTER FÖR BESLUTSFATTARE:

- ❖ Var inte rädd för att reglera plast - Det finns i allmänhet stort stöd för att ta itu med de problem som är kopplade till plast på olika sätt.
- ❖ Tillämpa inkrementell förändring och best practice - Börja med mjuka policys med mycket högt stöd, men kommunicera också visionen om en mer hållbar plastanvändning i en närstående framtid.
- ❖ Det finns ett klart stöd för ett utökat pantsystem. Pantprincipen har stor potential då den resulterar i att värdet av förpackningen indirekt bibehålls efter dess användning - Således kan en expansion av pantsystemet till fler kategorier av förpackningar vara ett effektivt steg framåt.
- ❖ Svenskar stöder en tullsats på importerad fossilbaserad plast - Inkluderandet av petrokemiska produkter i CBAM har sannolikt allmänhetens stöd.
- ❖ I längden är plastanvändning kopplad till en större fråga kring en ohållbar konsumism - Ansträngningar för att driva sedvänjor mot återanvändning, utlåning, delning och i vissa fall minskad konsumtion bör med tiden tillämpas. Berättelser kring framtidens hållbara materialanvändning kan spela en viktig roll i detta skifte.

Introduction

In recent years, issues related to the widespread production, use, and disposal of plastic have gained attention from the public and the media around the world. Plastic pollution in marine environments has stirred strong public sentiment due to the stark visual intrusiveness of this colourful anthropogenic material into 'wild' natural environments (Chertkovskaya *et al.* 2020). The limitations on the promised circularity of plastic are also a cause of increasing public concern as marginal recycling figures of the material are exposed year after year. After a decades-long focus on individual consumer responsibility, policymakers are starting to respond to plastic pollution as a serious environmental, geopolitical, and economic issue. But this shift is very recent and is so far limited to a few of the most problematic plastic products. In terms of addressing plastic's omnipresence and long-term environmental impact, policy approaches to date have barely scratched the surface.

The European Union (EU) has made some effort to respond to this crisis by accelerating the production of legislation on such topics as plastic bags (Council Directive 2015/720), single-use plastics (Council Directive 2019/904), plastic waste (Council Directive 2008/98/EC), and ecodesign (Council Directive 2009/125/EC). Additionally, guiding statements and plans, such as the EU plastic strategy, the circular economy action plan, and the EU green deal give some indication of what the commission foresees as potential future answers to some of the issues attached to plastics (Palm *et al.* 2021). Given the scale of the issue and the indications from Brussels, far more comprehensive

policy portfolios will likely be developed in the years to come.

Yet there is little research which evaluates general attitudes among the public toward potential plastic policies. We have therefore assessed public support for a range of different plastic policy proposals and governance instruments using a survey administered through the web panel "Citizen Panel" (Medborgarpanelen) by the Laboratory of Opinion Research at University of Gothenburg. Our hope is that this research will aid in predicting public responses to the more far-reaching plastics policies that will almost certainly be necessary in the coming years – which initiatives are likely to be met with early support, and which might be resisted or result in political polarisation, and therefore be harder to implement. Our overarching research question to address these queries is: *What are the opinions of Swedish citizens on a range of potential policies for the regulation of plastics?*

Apart from answering our research question, we are interested in respondents' more general opinions about plastics as such, and which type(s) of actor they consider carries the greatest responsibility for solving issues related to plastics. Additionally, background variables such as gender, age, education, income, place of residence, left-right placement, and party preference give us valuable demographic indications of the types of groups in the Swedish society that are more, or less, inclined to support various plastic-related policies.



Data & Method

The data in this study is based on the online survey results of the Citizen Panel wave 41, administered by the Laboratory of Opinion Research at the University of Gothenburg. The fieldwork was carried out over 34 days, from February 25 to March 30, 2021. The Citizen Panel consists of approximately 71 000 panellists, and recruitment includes both probability and non-probability-based methods (Martinsson *et al.* 2021). As one of seven studies in the Citizen panel 41, the sample size of the plastic opinion survey was 2 100 respondents. The survey was completed by 1 069 respondents, which corresponds to a response rate of 52 percent. The survey sample is quite representative of the Swedish population aged 18-85, with underrepresentation of the youngest age cohorts (<30 years), and overrepresentation of cohorts in the ages 30-49 and 50-69. The education levels represented by the sample (see Table 1 for frequencies) correspond fairly closely to those of the nation as a whole, with a slight underrepresentation of people in the lowest band. Similarly, there is some skewing in the self-declared party preference of respondents, with an overrepresentation of Green Party (MP) and Left Party (V) supporters, and an underrepresentation of Sweden Democrats (SD) supporters, compared to party preference polls made at the same time (Ipsos 2021; Kantar SIFO 2021).

The survey consists of 13 questions and covers five main areas of opinion on plastics (see Appendix B): general attitudes towards plastic and views on various actors' responsibility in connection to plastic; opinions on the newly implemented plastic bag tax; attitudes toward plastic policy proposals; opinions on textile-related policy proposals; and evaluation of effectiveness of policy instruments to regulate plastic (packaging). The survey utilises a wide range of question types, including multiple-choice questions, Likert scale questions, and open-ended questions. Most of the questions measuring general attitudes towards plastic have a single or multiple-choice structure, whereas questions on policy proposals have a matrix format with Likert scale options. The open-ended question format supplements the question on attitudes towards the plastic bag tax. The study also contains background variables on gender, age, education, income, occupation, place of residence, and political variables measuring Swedish party preference and self-placement on a subjective left-right political scale. Table 1 is a summary of the background variables with the given frequencies of our sample.

Table 1 Response distribution by social and political variables (percent)

Variable	Percent	N
Gender		
Women	51	560
Men	49	547
Age		
Under 30 years	9	98
30-49 years	30	333
50-69 years	39	437
70 years or more	22	239
Education		
Low	4	39
Medium-low	34	376
Medium-high	29	322
High	33	369
Income		
Low	23	249
Medium	44	462
High	33	346
Occupational status		
Employed/self-employed	58	646
Unemployed/beneficiaries	7	82
Retired	30	327
Student	5	51
Residence		
Large city	31	338
City or larger town	38	421
Smaller town	17	184
Rural area	14	155
Left-right self-placement		
Clearly to the left	7	82
Somewhat to the left	21	225
Neither to the left nor the right	43	475
Somewhat to the right	24	259
Clearly to the right	5	54
Party preference		
The Social Democratic Party (S)	29	243
The Moderate Party (M)	20	166
The Sweden Democrats (SD)	15	127
The Left Party (V)	14	123
The Centre Party (C)	9	76
The Green Party (MP)	7	56
The Christian Democratic Party (KD)	3	29
The Liberal Party (L)	3	27

Note: Education, Low = up to compulsory school or equivalent, Medium-low = up to upper secondary school or equivalent, Medium-high = post-secondary education, college/university less than 3 years, High = College/University education, 3 years or longer. Income refers to monthly income before taxes in Swedish Crowns (SEK), Low = less than 4 000-18 999 SEK, Medium = 19 000-36 999 SEK, High = 37 000 SEK or more.

LIMITATIONS

It is important to make a distinction between actual behaviour and self-reported attitudes and behaviour. All questions included in the survey measure self-reported attitudes rather than actual behaviour in relation to policies. As the policy proposals are not conditional nor measure actual behaviour, the threshold for supporting policies is relatively low (Kormos & Gifford 2014). This can potentially provide a bias towards affirmative answers among the respondents.

Additionally, there are structural issues attached to surveys which evaluate attitudes or self-reported behaviours as they tend to neglect the larger picture of practices shaped by our socio-material surroundings. Hence, researching the choices and driving factors behind single policy preferences risks providing a misleading picture of achievable, sustainable behaviour changes, which ultimately in many cases are rooted in an unsustainable socio-material realm (Shove 2010).



Rationale for the formulation of questions

The preparation of the survey and the formulation of the questions were guided by curiosity about the general attitudes of Swedish citizens towards plastics. We wanted to know how much of an issue the public considered plastics to be, who they think has responsibility to address problems related to the material, and what they think about various policy suggestions regarding plastics. Additionally, we were interested in exploring how this corresponded to background variables such as gender, age, education, income, place of residence, left-right placement, and political party preference. Hence, the overall purpose of the survey was to evaluate the landscape of plastic attitudes among the Swedish population, not least in connection to potential policies. The first section of the survey consisted of six questions. This section included questions on how big an environmental issue the respondents think that plastic constitutes; and which aspects of plastic they considered the biggest issues; and benefits of the material. In this section, respondents were also asked if they think plastic is a good or bad material, and who they consider most responsible for managing the issues around plastics. This first segment of questions was designed to gain an overview of what Swedes generally think about plastic as such, and who they consider to be most accountable.

The next section covered the newly implemented excise duty on plastic bags. The tax has caused debate along political fault lines in Sweden, with interest groups affiliated with the political right voicing dissatisfaction. A similar trend around regulations of plastic bags can be observed elsewhere, notably in the USA (Nielsen *et al.* 2019). In the second section we inquired what the respondents thought about the newly implemented tax, followed by an open-ended question where they were asked to justify their position. These questions were asked to get an overview of general attitudes towards the new policy as a potential yardstick for the Swedish public's appetite for plastics policies more broadly. We were also curious to see if the polarised positions expressed by interest groups were reflected in the views of the public.

The third section of the survey consisted of a battery of 18 policy proposals related to plastics, with respondents asked to rank each one on a five-point scale from "very good proposal" to a "very bad proposal".

The formulation of the policy proposals was guided by a few key considerations. First, we sought a balance between creative and destructive policy instruments – creative here refers to supporting niches or alternatives considered to be more sustainable, while destructive refers to policies aimed at destabilising the current unsustainable regime (Kivimaa & Kern 2016). Within both the creative and the destructive groups, a mix of economic (e.g., subsidies, taxes, levies, deposit-refund scheme, public procurement, R&D), regulatory (e.g., performance standards, prohibitions, and bans), and soft (information, campaigns, voluntary measures) instruments was formulated for the survey (Rogge & Reichardt 2016; Kivimaa *et al.* 2017). This terminology originally comes from Joseph Schumpeter's thought (1942/1975) on the impact of innovation on business cycles. Schumpeter described innovation as a process of "creative destruction" because it not only leads to new ways of doing things, but also disrupts the previous conditions. Kivimaa & Kern (2016) in turn use this concept to organise innovation policies into an intentionally oriented analytical framework for sustainability transitions. The behavioural science concept of "carrots and sticks" is a related notion which we also make use of in this report. The distinction is that "carrots and sticks" apply at the level of individual behaviour, with carrots (incentivising measures) appealing to the desired behaviour, while sticks (obstructing measures) are used to hinder undesired behaviour (Gächter, 2012). These forces that influence individual actors in turn play into larger creative destruction patterns at the levels of business cycles and overall societal change.

Furthermore, we considered the European waste hierarchy (Council Directive 2008/98/EC). The hierarchy is useful for assessing the environmental gains of different measures as waste management largely reflex high vs. low energy and material use in connection to plastics (Gharfalkar *et al.* 2015; Nielsen *et al.* 2018). The hierarchy also makes clear a significant correlation: more radical policies provide higher environmental gains, but they also impact people's day-to-day behaviour more. In order to assess how these variables might influence the public's appetite for plastic regulation, we have mixed low effort/low gain policies (e.g., recycling- or substitution-driven policy proposals) with high effort/high gain policies (e.g., reduced-use- or reuse-driven policy proposals). While plastics are

used in various applications across virtually all sectors, their use is considered most problematic in the areas of packaging, consumer products, and textiles. This is because the use of plastic in these sectors tends to be short-term and make up a significant share of the overall volume of plastic waste (Geyer 2020). We therefore also focused on these three areas of plastic use in the formulation of the questions.

The fourth section of the survey focused exclusively on the use of plastics in textiles. From it being a marginal phenomenon in 1960, approximately two thirds of all textiles produced in 2015 were made of synthetic polymers, a proportion that is expected to increase (Krifa & Stevens 2016). Textiles is also a sector in which trend-sensitive short-term use has increasingly become the standard in recent decades (Ellen MacArthur Foundation 2017, p.18; Geyer 2020). In the age of fast fashion, clothing chains have pushed

a business model of replicating catwalk, seasonal, and high-fashion trends, and mass-producing them at low cost through global supply chains. As such, textiles, like packaging, have become items of planned obsolescence. Given the unsustainability of this, the textile sector must transform soon, and as such, development of new policies on this issue are expected. We addressed this in the fourth section of the survey with five textile-related policy proposals.

In the fifth and final section, respondents were asked to choose up to three measures, from a list of nine, that they considered most efficient for reducing the environmental effects of plastic packaging. The measures were derived largely from the sets of creative and destructive innovation policies outlined by Kivimaa and Kern (2016). We refer here to 'plastic packaging', rather than 'plastic' more generally, in order to make the measures more concrete to the respondents.

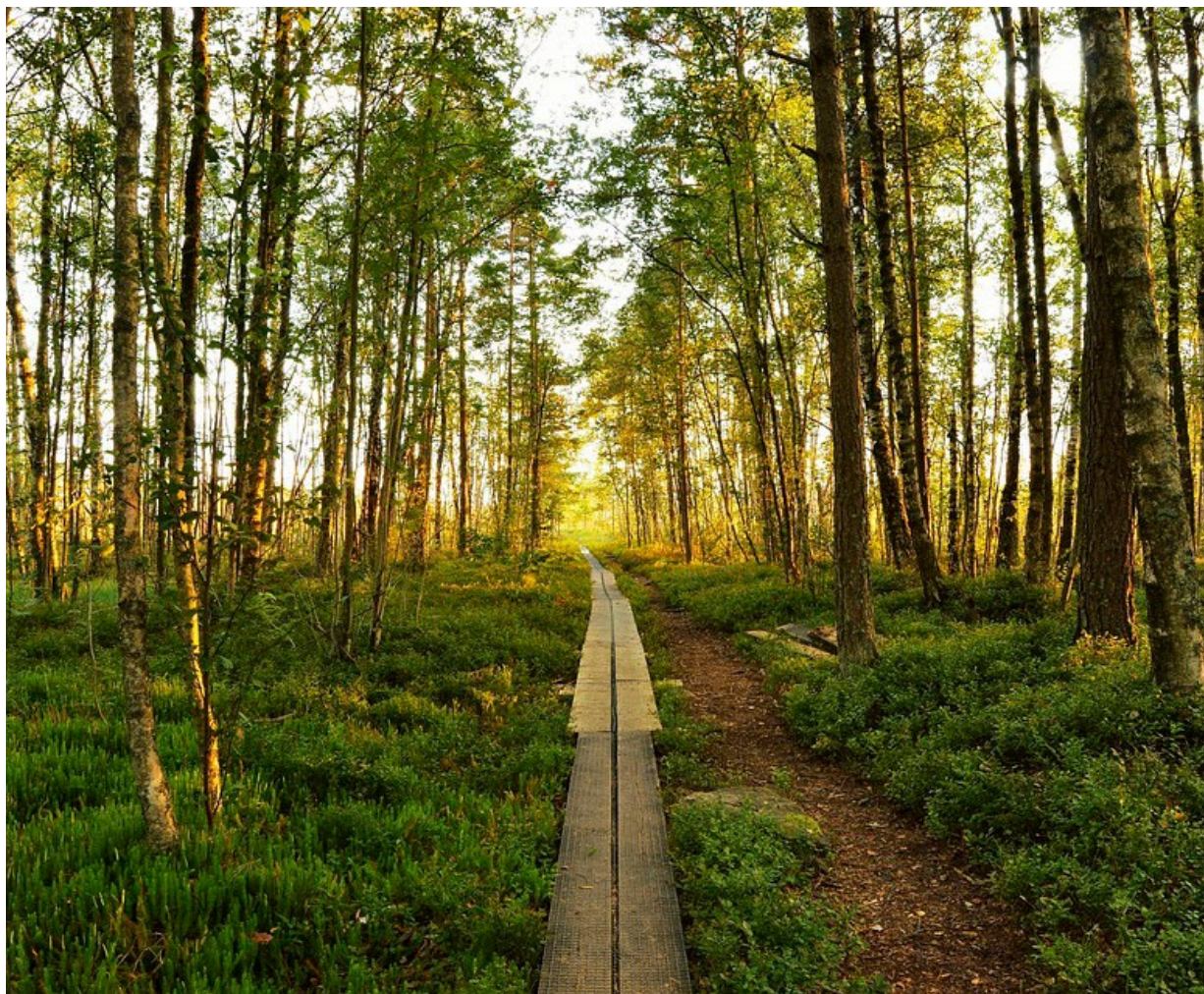


Environmental opinion in Sweden

Swedish people are seriously concerned about the environment and climate change, which is reflected in a higher-than-global-average commitment to green initiatives. In public surveys about issues of concern, the environment and climate are consistently rated high. Swedes frequently favour green investments and show willingness to adopt more environmentally friendly behaviour (Robertson 2020, Martinsson & Andersson 2021). However, the public is more wary towards certain green policy proposals, and support for government instruments is less coherent than it is for corporate or individual initiatives. While information campaigns and subsidies enjoy public support, policies involving taxes and fees are less popular (Naturvårdsverket 2018). There are cleavages in the population along demographic lines, with pro-environmental attitudes more prevalent among some based on gender, age, education, and ideology than among others. Most notable in recent years has been an increasing polarisation of environmental issues along

left-right political lines (Jönsson 2019; Robertson 2020).

Cross-country studies indicate relatively high support for environmental initiatives among the Swedish public compared with the global average. Swedes are among the most concerned citizens in Europe about the impacts of climate change (European Social Survey 2018), and are most likely, of all the EU28 publics, to indicate that environmental protection is important to them (Eurobarometer 2020). Similarly, in a PEW Research Center survey of 19 publics (2020), the Swedish citizenry are among the most positive publics towards environmental protection measures, even at the expense of job creation. However, Swedes are among the least likely nationals to say that they are affected by the impacts of climate change, or to think that their governments are doing too little to mitigate the effects of climate change (Pew Research Center 2020).



Public opinion on plastic

What does the public think about plastic? The first section of the survey measures the public’s general opinions of plastic and includes questions on how big an environmental problem plastic constitutes (Figure 1); what the biggest single disadvantages (Figure 2A) and benefits (Figure 2B) of the material are; and whether plastic should mainly be considered a good

or bad material (Figure 2C). The last of these questions was intentionally simplified with the aim of forcing an intuitive response about the material after the respondents had considered the issues and benefits of the material. Thus, this section provides an overview of the public’s assessments of plastic and its consequences for the environment.

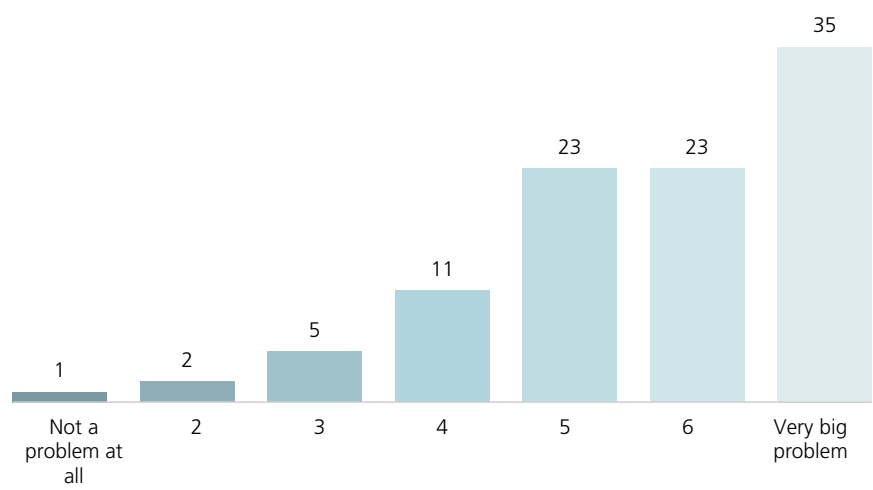


Figure 1 Opinions on plastic as an environmental problem (percentage)

Note: The question was “How big an environmental problem do you think plastic is?” Response options on a seven-point scale ranged from 1 (=not a problem at all) to 7 (=very big problem). The percentage base consists of those who answered the question. Number of respondents: 1 106.

As evidenced by the results of the first question in Figure 1, over half of the distribution (58%) is found in the top band of the seven-point scale: the idea of plastic as a very big environmental problem. By

comparison, only 3% of responses were in the two lowest scale steps, indicating the view that plastic is not an environmental problem. The three middle scale steps (3-5) amount to 39%.

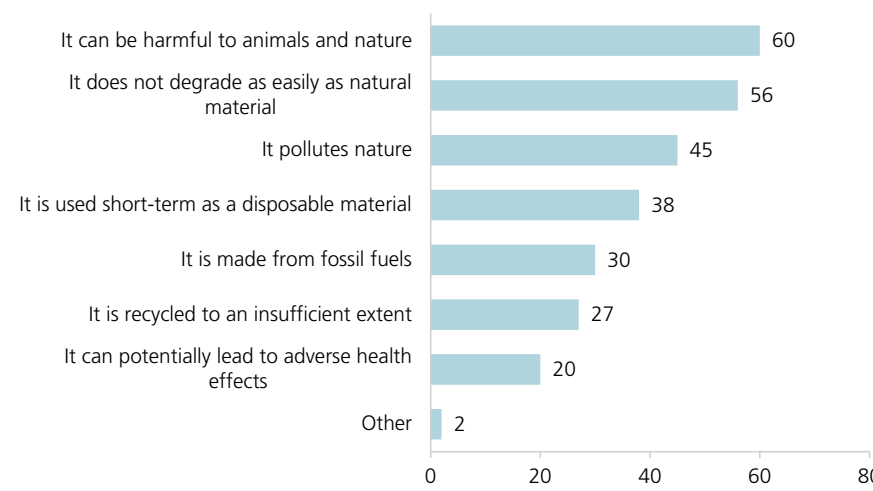


Figure 2A Most negative aspects of plastic (percentage)

Note: The question was “What do you think are the biggest disadvantages of plastic?” Respondents could choose up to three alternatives. The percentage base consists of those who answered the question. Number of respondents: 1 100.

Next, respondents were asked to assess different negative and positive aspects of the material by selecting up to three that they considered the most impactful. In the assessment of the negative aspects (Figure 2A), plastic as harmful to animals and nature was ranked highest, with 60% of respondents listing it as the most negative aspect of plastic. Next, the slow or absent degradation of the material, and its pollution of nature, were chosen by 56% and 45% of the respondents respectively. The short-term use of plastic as a disposable material was selected by 38%, and plastic's fossil fuel composition by 30%. Less than a third of respondents listed the insufficient recycling

of the material (27%), and a fifth of respondents ranked health-related issues among the most negative aspects of plastic.

In the assessment of the most positive elements of the material (Figure 2B), the varied uses of plastic were ranked highest, with 77% of respondents listing it among plastic's most positive aspects. Much lower was the material's use in healthcare-related services (49%) and its protection of foodstuffs (42%). Plastic's lightness (38%), low price (29%), and long lifespan (23%) were among the least mentioned positive aspects, with the lowest overall score for plastic's value in creating jobs and growth of the economy (5%).

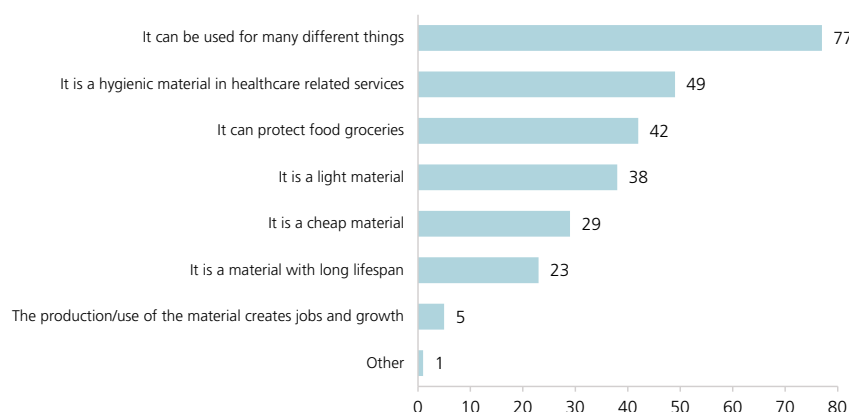


Figure 2B Most positive aspects of plastic (percentage)

Note: The question was "What do you think are the biggest benefits of plastic?" Respondents could choose up to three alternatives. The percentage base consists of those who answered the question. Number of respondents: 1 098.

In a final evaluation, respondents were asked to make an overall assessment of the material, considering both its drawbacks and advantages. As indicated by Figure 2C, the public is slightly more positive than negative towards plastic when considering all aspects. 44% regard the material as good, compared to 35%

who consider plastic to be bad overall. The distribution of views, with most responses falling in the middle three ranges (82% in total) rather than either of the extremes, suggests that the public overall take quite a balanced view of plastics.

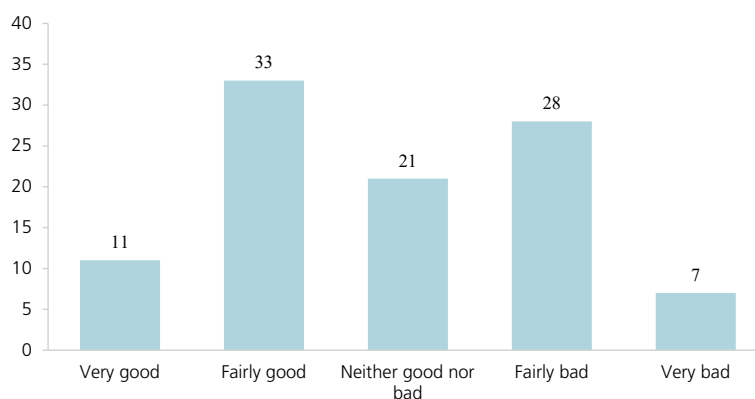


Figure 2C Opinions of plastic as mainly a good or bad material (percentage)

Note: The question was: "Given the benefits and disadvantages of plastic, is plastic essentially a good or bad material in your opinion?" The percentage base consists of those who answered the question. Number of respondents: 1 101.





Who is responsible?

The next question addressed which actors’ respondents see as most responsible for managing the negative environmental effects of plastic. Here respondents could choose up to three alternatives, and response options included a mix of political actors, plastic manufacturers, individuals, and NGOs. In a follow-up question, respondents were asked to rank their chosen organisations and groups, from mainly responsible to second and third most responsible. As seen by the distribution in Figure 3, manufacturers of plastic products were placed at the top, with 59% of respondents

listing them as responsible for managing the environmental effects of plastic. The second most named group were individuals, whom 53% of respondents consider responsible for plastic management. Different political actors were listed in the middle segment, with the EU ranked highest at 43%, followed by the Swedish government (29%), parliament (26%), and government agencies (23%). At the bottom, others and NGOs were cited by 3% and 1% of respondents respectively.

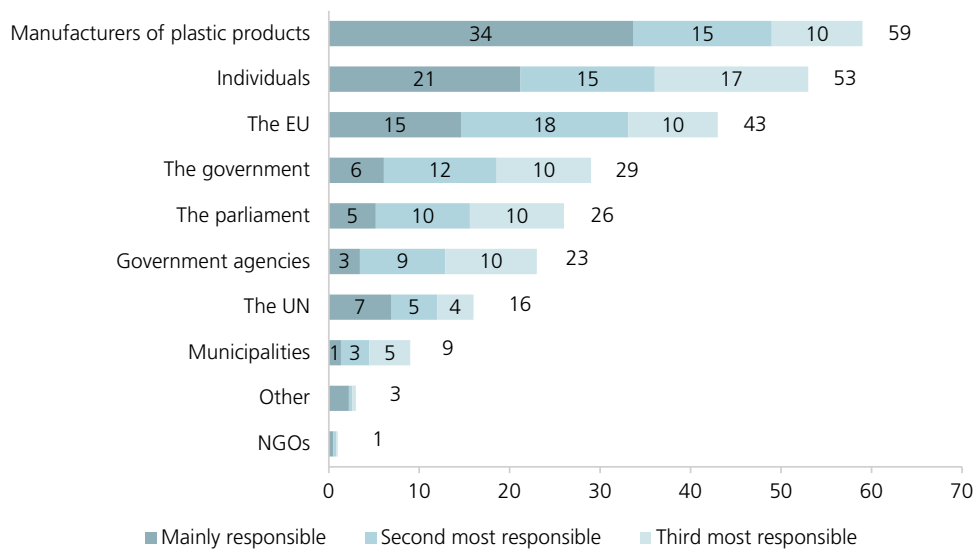


Figure 3 Responsible for management of environmental effects of plastic (percentage)

Note: The figure shows the combined results of two questions on plastic management responsibility. The first question was: “Which of these organisations and groups do you generally think have the greatest responsibility for dealing with negative environmental effects linked to plastic?” Respondents could choose up to three response options. The second question was: “Of the three organisations and groups you chose, which do you consider to have the most, second and third most responsibility for dealing with negative environmental effects linked to plastic?” The distribution, in terms of first, second, and third preference, is not included for Other and NGOs in the figure due to low frequencies. The percentage base consists of those who answered the question. Number of respondents: 1 089.

The results of Figure 3 suggest that the public hold manufacturers and individuals accountable for plastic management to a greater extent than they do of various political actors. However, the question design allows respondents to consider multiple aspects of the actors’ responsibility to manage plastic. Assessments of organisations and groups may reflect respondents’ values in reference to political views, trust, and general attitudes towards the actors. It is also possible that assessments of actors are based not on their ethical or causative responsibility, but rather on their ability to affect outcomes: manufacturers are likely seen by many to control the supply, and individuals through

their consumption to determine the demand. And although political actors admittedly have extensive power to govern the politics of plastic, the bureaucracy of politics may dampen the public’s view of political actors as efficient. Thus, we must consider the possibility that respondents’ evaluations of actors reflect a mix of ethical and practical considerations – in other words, the question might for some respondents not only be who *should*, but rather who *can* manage the environmental effects of plastic.

The distributions of the follow-up question, in which respondents were asked to rank the extent of respon-

sibility each of the chosen actors hold, largely follows the pattern of the previous question. The actors considered to be responsible by the highest number of respondents are also seen as carrying the highest *degree* of responsibility. Manufacturers and individuals are assigned the greatest degree of responsibility. 34% of respondents placed manufacturers first, 21% of respondents considered individuals the most responsible. Among the political institutions, the EU stands out as being the most selected option, with 15% considering it as the most responsible actor and 18% as the second most responsible (highest of any second most

responsible options). The government, the parliament, and government agencies, receives foremost lower numbers for the most responsible option but see higher proportions for second most (12-9%) and third most responsibility (10%). It is also important to add that due to the mix of alternatives, it is possible that the Swedish political institutions (government, parliament, public authorities, and municipalities) represent a similar type of response spread out on four options. If these would have been collided into a single 'the Swedish state' option, the distribution would maybe have looked quite different.



The debated plastic bag tax

In May 2020, a plastic bag tax was introduced by the Swedish government. The tax is part of the government's measures to meet national environmental objectives and comply with the European Union's plastic bags directive (2015/720). The directive was created to reduce the use of plastic carrier bags, and thus to decrease littering and the spread of microplastics (European Commission 2021). The tax aims to reduce consumption to a maximum of 40 bags per person per year by the end of 2025, with a cost increase of 3 SEK per plastic carrier bag¹, which translates to a doubling of the commonly used retail price (Finansdepartementet 2020). Since the tax was introduced in May 2020, there has been a significant decrease in the consumption of plastic bags² from 74 bags per person in 2019 to 55 in 2020, a decrease of 19 plastic bags per person per year since the year before. In comparison, the previous rate of decline was 3-6 plastic bags per person over the years 2017 to 2019 (Naturvårdsverket 2021).

The plastic bag tax was preceded by much debate in the Swedish media and was considered somewhat controversial when introduced. The environmental efficacy of the policy was disputed by political representatives as well as trade organisations (see, for example, Interpellation 2020/21:422; Svensk Handel 2020). The fairness of including recycled bags in the tax, and

of not differentiating between fossil and biobased plastic, were subject to debate, and the environmental superiority of alternatives like paper and cloth bags was disputed (Fall 2020; Sterner 2020). Biobased plastic bag producers complained about not being excluded from the tax (Pettersson 2021). Some critics argued the broad scope of the tax was motivated by monetary rather than environmental reasons. Others claimed that the inclusion of recycled and biobased materials in the tax discouraged further innovations in this area. Additionally, the policy's stated purpose of decreasing plastic littering has been questioned, as many plastic bags in Sweden are reused as trash bags and incinerated after use (Fall 2020).

OPINIONS OF THE PLASTIC BAG TAX

Though there are national studies on public opinions of green policy instruments and environmental taxes (e.g., Jagers *et al.* 2018; Harring 2020; Larsson *et al.* 2020), we know of no studies that measure public opinions on the plastic bag tax. Consequently, we felt it useful to include questions on the plastic bag tax in our survey. Results (Figure 4) show that 51 percent of respondents are in favour of the tax. In contrast, 34 percent of respondents feel negatively towards the tax, and 15 percent see the tax as neither positive nor negative.

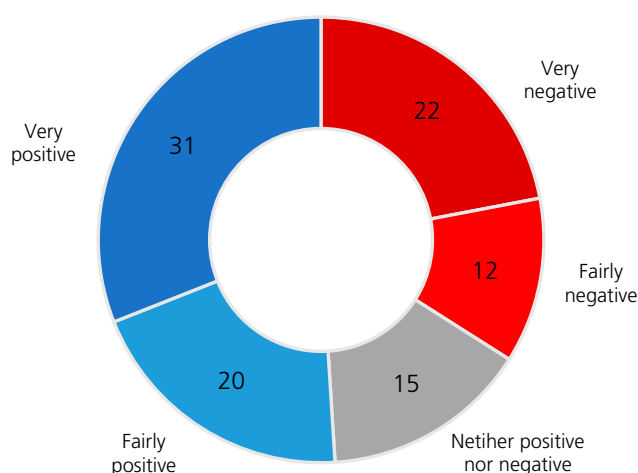


Figure 4 Opinions on plastic bag tax (percentage)

Note: The question was "What is your opinion on the plastic tax ban that was introduced in Sweden May 1, 2020?" The percentage base consists of those who answered the question. Number of respondents: 1 098.

1. A cost increase of 0,30 SEK per bag for carriers thinner than 15 micrometers with a volume of up to 7 liters.
2. calculations are based on plastic bags 15-50 millimetres.

Support for the tax was higher than we expected, given the vocal resistance to the tax among certain public and political groups since its implementation. However, an examination of differences based on social and political background variables suggests variations between groups in the sample. As seen in table 2, there are relevant differences in the opinions of women and men on the plastic bag tax. While women are strong supporters of the tax, with 61% being positive, men are much less in favour of the tax with 41% being positive. Conversely, only 25% of women are negative towards the tax, while 44% of men are negative.

There are also distinct differences in groups based on education level, most noticeably between the lowest and highest education groups. Among the lowest education span (corresponding to compulsory school), 42% of respondents are positive about the tax. Among the highest education span (corresponding to three years or more of university/college education), 57% are positive. 50% of people with low education are negative, while only 28% of the highest educated are negative. Among the three highest education groups, the majority of respondents are positive about the plastic bag tax. Among the lowest educated, the majority feel negatively towards the tax³.

There are small differences between groups based on age, income, and place of residence. However, there are larger dissimilarities between different political affiliations, suggesting the plastic bag tax has become politicised. There are clear differences between groups on the left-right spectrum, with people who located themselves on the political left being much more positive towards the tax than people who identify as right-wing. Among respondents clearly to the left, 73% are positive, while only 17% of respondents clearly to the right express a positive attitude towards

the tax. A vast majority of right-wing respondents oppose the tax, with 74% expressing a negative attitude; the corresponding value for respondents on the left is 16%. Respondents identifying as somewhat left or somewhat right in their politics showed similar but less extreme tendencies of opinion. Taken together, these figures suggest that the public's views on the plastic bag tax accord with their broader ideological or party sympathies. The middle segment, which constitutes those neither to the left nor right, are somewhat positive about the tax, with 53% positive, 32% negative, and 15% neither negative nor positive.

Similar differences can be seen with regard to party preference: supporters of parties on the political left are more positive toward the plastic bag tax than supporters of parties on the political right. The most positive sentiment was found among supporters of the Green Party (MP), with 76% of respondents in favour of the tax. This is closely followed by supporters of the Left Party (V), with 70% positive about the tax and the Social Democratic Party where 69% are positive about the tax. More moderate levels of support are found among supporters of the two liberal aligned parties. Approval for the tax stands at 57% for supporters of the Centre Party and 47% for the Liberal Party. Among those most critical of the plastic bag tax are supporters of right-wing parties. Here, a majority of party supporters oppose the tax with negative measures, ranging from 52% (the Moderate Party and the Christian Democratic Party) to 76% (the Sweden Democrats). As seen by the large differences, with divergences of up to 71% (MP/SD). In Figure 6, the potential politicisation of the plastic bag tax is illustrated further and by a comparison of mean values for each party. As seen in the figure, there are large mean differences between parties, at most ranging from 1.78 (SD) to 4.39 (MP) on a five-point scale, where 1 corresponds to very negative and 5 corresponds to very positive to the plastic bag tax.

3. The proportions for the low education group should be interpreted with caution due to few respondents.

Table 2 Opinions on the 2020 plastic bag tax by social and political variables (percentage)

	Very negative	Fairly negative	Neither negative/ positive	Fairly positive	Very positive	Total	N
All	22	12	15	20	31	100	1098
Gender							
Woman	15	10	14	20	41	100	556
Man	29	15	15	20	21	100	542
Age							
Under 30 years	17	8	15	26	34	100	95
31-49 years	24	13	14	21	28	100	330
50-69 years	26	12	13	18	31	100	435
70 years or more	15	15	17	21	32	100	238
Education							
Low	(42)	(8)	(8)	(18)	(24)	100	38
Medium-low	23	13	16	23	25	100	373
Medium-high	24	14	12	16	34	100	320
High	17	11	15	21	36	100	367
Income							
Low	17	12	14	25	32	100	246
Medium	22	12	13	20	33	100	458
High	25	14	16	18	27	100	344
Residence							
Large city	23	11	12	21	33	100	335
City or larger town	17	14	14	24	31	100	419
Smaller town	27	13	19	16	25	100	182
Rural area	27	11	18	12	32	100	155
Left-right self-placement							
Clearly to the left	5	11	11	29	44	100	82
Somewhat to the left	6	9	17	22	46	100	224
Neither to the left not right	18	14	15	23	30	100	470
Somewhat to the right	42	13	12	14	19	100	259
Clearly to the right	61	13	9	6	11	100	54
Party preference							
S	6	10	15	29	40	100	241
M	37	15	12	14	22	100	166
SD	64	12	13	3	8	100	127
V	6	10	14	29	41	100	123
C	12	15	16	21	36	100	75
MP	0	5	13	20	62	100	56
KD	(31)	(21)	(7)	(10)	(31)	100	29
L	(15)	(23)	(15)	(35)	(12)	100	26

Note: The question was: "What is your opinion on the plastic bag tax that was introduced in Sweden 1st of May 2020?". ¹Education, Low = up to compulsory school or equivalent, Medium-low = up to upper secondary school or equivalent, Medium-high = post-secondary education, college/university less than 3 years, High = College/University education, 3 years or longer. ²Income refers to monthly income before taxes in Swedish Crowns (SEK), Low= less than 4 000-18 999 SEK, Medium= 19 000-36 999 SEK, High= 37 000 SEK or more. ³Party abbreviations: S = The Social Democratic Party, M = The Moderate Party, SD = The Sweden Democrats, V = The Left Party, C = The Centre Party, MP = The Green Party, KD = The Christian Democratic Party. L = The Liberal Party. Values in parentheses indicate less than 50 respondents; associated proportions should be interpreted with caution. The percentage base consists of those who answered the question (1 098).

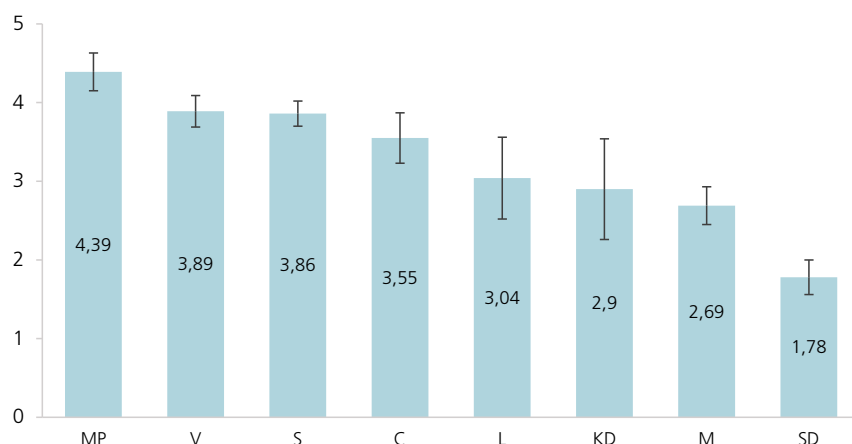


Figure 5 Opinions on plastic bag tax after party preference (means)

Note: The question was: “What is your opinion on the plastic bag tax that was introduced in Sweden 1st of May 2020?” Response options on a five-point scale, 1=very negative, 2= fairly negative, 3= neither negative nor positive, 4= fairly positive, 5= very positive. Party abbreviations: MP=The Green Party, V= The Left Party, S =The Social Democratic Party, C= The Centre Party, L= The Liberal Party, KD= The Christian Democratic Party, M= The Moderate Party, SD= The Sweden Democrats. The figure shows the mean of opinions on the plastic bag tax after party preference, 95% confidence interval included.

MOTIVES FOR OPINIONS ON THE PLASTIC BAG TAX

Due to the heated debate around the tax and the symbolism of the plastic bag, we were curious about the respondents’ justifications for their position on the tax. In an open-ended question, respondents were asked to give reasons for their opinion on the question of the plastic bag tax. The replies were manually coded and based on those responses categorised into eight positive and eight negative categories. An additional

category called “other” was added, where various replies which could not be categorised into the main categories were placed. The open-ended question was “Why do you think that the plastic bag tax is [*reply to previous question*]?” The question design did not limit the number of justifications given by each respondent. However, a maximum of three motives were included in the coding. In total, 1 006 respondents answered the open-ended question and gave a total of 1 317 motives.⁴

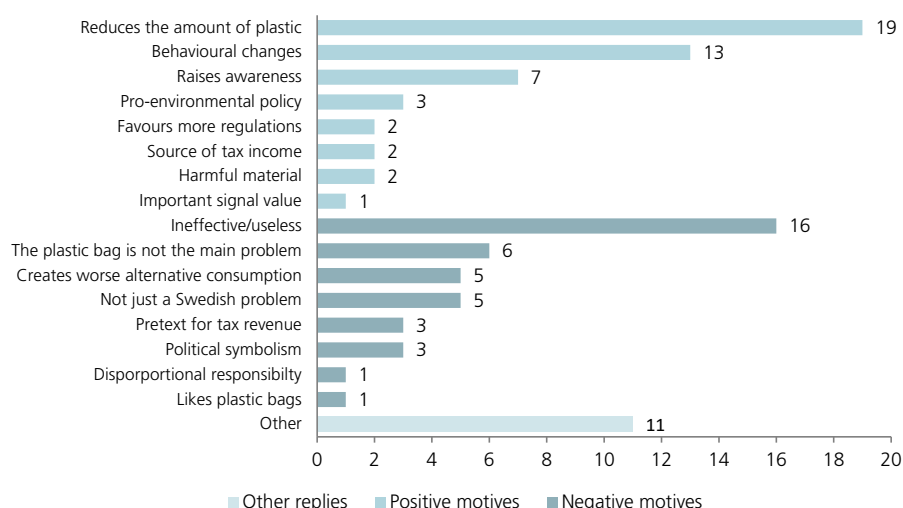


Figure 6 Motives for opinions of the plastic bag tax, open-ended question (percentage)

Note: Distribution of motives for the open-ended question. The question was: “Why do you think that the plastic bag tax is [*reply to previous question*]?” Based on 1 317 replies, the percentage base consists of those who answered the question. Number of responses exceeds the number of respondents as up to three replies were coded.

4. 1 006 respondents gave one motive, 278 respondents gave two motives, and 33 respondents gave three motives.

Figure 6 shows the share of total replies that went into the 16 categories. Among the positive categories, the most common motives included that the tax: (1) leads to decreased use of plastic (19%), (2) causes behavioural change (13%), and (3) raises awareness (7%). Less commonly mentioned positive motives were that the tax enables more environmentally friendly alternatives (3%), a desire for a stricter policy (2%), that the tax is a source of income for the state (2%), that plastic is a harmful material (2%), and that the tax sends an important signal (1%).

The most common negative motives refer to the tax as (1) inefficient (16%), (2) misguided because the plastic bag is not the main problem related to plastic (6%), (3) creates worse alternative consumption (5%) and does not solve the problem because plastic bag use is not limited to Sweden (5%). Less common negative replies refer to the tax as: a pretext for the state to gain additional tax revenues (3%), empty political symbolism (3%), putting a disproportionately large responsibility on individuals (1%), and affecting the price of a product the respondent likes using (1%).

An interesting aspect in connection to these replies is the heavy symbolism of the plastic bag, which some respondents approve of, and others see as a problem. Although the plastic bag might, due to its form and ubiquity, be one of the more problematic plastic items, it is also something of a stand-in for plastic as such, and thus carries a symbolic weight recognised by both proponents and critics of plastic regulation (Clapp & Swanston 2009; Nielsen *et al.* 2019). The symbolism of addressing the plastic bag therefore seems to be interpreted in multiple and contradictory ways by the respondents. For example, opponents of the tax argue on one hand that it ignores the virtues of the material, and on the other that plastic is so problematic that a measure like this is of *merely* symbolic value. Conversely, advocates of the tax argue both that the bag is among the most damaging of all plastic items, and that the tax's main value is symbolic – only a first step toward the vital task of regulating plastic more broadly. The similarity between observations of respondents at either ends of the approval/disapproval spectrum is noteworthy: same outcomes, but different evaluations of their merit.



Attitudes towards plastic policy suggestions

The next phase of the survey consisted of a battery of possible policies on plastic. The suggestions put forward were motivated by a few key principles, as discussed above in the section on the rationale for the formulation of questions. In Table 4 below, some of these variables, such as the *policy instrument type* and *resource use hierarchy*, are listed along the balance of opinion, which indicates the difference between those in favour and those who oppose the policy proposals. By subtracting negative sentiments from positive ones,

we determined a balance of opinion ranging from +100 to -100, with positive values indicating that a majority of respondents are in favour of proposal(s), and negative values indicating the opposite. A column for the *targeted actor* – that is, the actor who, in due time, is expected to change their current course of action or be affected by the policy, is also included. The policies are listed in the table in abbreviated form; the complete questions can be seen in Appendix A.

Table 4 Plastic policy proposal description and theoretical model (net balance of opinion)

Policy proposal	Balance of opinion	Regulation type	Hierarchy	Targeted actor
Standardized recycling information on plastic products	+89	Soft	Recycling	Individuals
Recyclable new plastic products	+87	Soft	Recycling	Retail/industry
Green public procurements	+79	Economic	Substitute/recycling	Industry
Extended deposit-refund system	+79	Economic	Recycling	Individuals
Greening mass balance	+77	Regulatory	Substitute/recycling	Industry
Source separation of public waste bins	+76	Soft	Recycling	Individuals
State investments in green production	+74	Economic	Substitute/recycling	Industry
Bans (on disposable packaging)	+69	Regulatory	Reduce/reuse	Retail
Information campaigns	+67	Soft	-	Individuals
Relative waste management fee	+54	Economic	Recycling	Individuals
Plastic divestments of public pensions	+47	Economic	-	Industry
Tariffs (on imported plastic)	+46	Economic	-	Industry
Goods in bulk	+36	Regulatory	Reduce/reuse	Retail/individuals
Ban (fossil-based) plastic production by 2030	+31	Regulatory	Reduce	Industry
Municipal loaning services	+28	Economic	Reuse	Individuals
Store repairs (on plastic products)	+22	Regulatory	Reuse	Retail
Tax on disposable packaging	+21	Economic	Reduce	Retail/individuals
Fees (for stores) on disposable packaging	+11	Economic	Reduce	Retail

Note: A list of the full phrasing of all policy proposals is found in Appendix A. Regulation type, resource use hierarchy, and target actors are variables which are expected to affect the net support for the policies. The balance of opinion indicates the net value of the proportion of respondents who thinks the policy proposal is fairly or very good, minus the proportion of respondents who thinks that the policy proposal is fairly or very bad (see Figure 7A-C). Measures can therefore differ from +100, which corresponds to all respondents in favour of the proposal, to -100, which corresponds to all respondents opposing the proposal. The percentage base consists of those who answered the question. Number of respondents differs between the proposals, from 1069 to 1098.

As can be observed in the table above, there are big differences in the support rate between the different policies. Differences partly coincide with the three different variables for how we formulated the questions: policy instrument type, resource use hierarchy, and targeted actor. Policies that are aimed at reuse and reduce principles receive overall less support than policies aimed towards substitution and recycling. This is likely connected to the fact that reduce and reuse principles require more onerous behaviour changes for con-

sumers. Similarly, many of the policies that are aimed at individuals or the retail sector and contain stricter *regulatory* formulations or *economic* incentives receive less support than proposals of a *soft*, i.e., voluntary or informative type. There are, however, some policies that do not follow this tendency as distinctly. First, an extension of the deposit-refund scheme (+79%), which is an economic incentive in which the burden for habit change falls largely on consumers, is popular. A reason for this could be that a deposit-refund scheme

is regarded as a somewhat voluntary positive economic incentive as you get back the deposit if you wish to return the container through the deposit-refund scheme system. This sets it apart from many other policies that combine these two variables (economic; consumer burden), such as a tax on plastic packaging, which are markedly less popular, potentially as it is seen as an involuntary negative economic burden. Also noteworthy is the popularity (+69%) of a ban on disposable packaging, even though it is both a strict regulatory measure (ban) and a measure that targets retail and thence, at one short remove, consumers. The surprising popularity of this can perhaps partly be explained by the wording of the proposal: a “ban on disposable plastic packaging where there are alternatives”. The dependent clause *where there are alternatives* indicates a substitution

that might entail minimal habit change for the consumer – although not necessarily, since “alternatives” is an ambiguous concept that might be said to include changed principles, practices, or expectations. Green public procurement (+79%), greening public pension funds (+47%), and tariffs (on imported plastic) (+46%), are policies with an economic incentive which also get high to moderately high support. These are, however, a bit more abstract, and it is not as clear that the policies will have a day-to-day impact on the respondent. Rather, they are aimed at the plastic industry via the activities of public authorities. Since these questions are not conditional, we might therefore expect to see a higher share of support for these policies, compared to a conditional question where an expected outcome or consequence of the policy is included in the question.

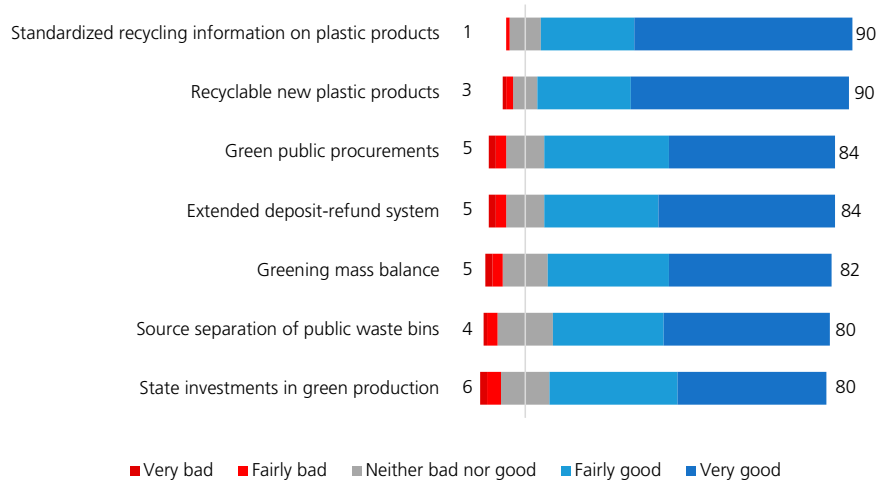


Figure 7A High support policies (percentage)

Note: Proportions on the right show the total share of responses for options “very good proposal” and “fairly good proposal”; proportions on the left show the total share of responses for the options “fairly bad proposal” and “very bad proposal”. The percentage base consists of those who answered the question. Number of respondents differs between the proposals, from 1 069 to 1 078.

Going into more detail, Figure 7A shows the policies which receive the highest support among respondents. All these policies have a net balance of opinion above +70%. It is fair to conclude that the Swedish population overall, despite a potential confirmation bias in connection to the questions, are supportive of these measures. Many of these policies are of a relatively soft type, requiring little effort by consumers, but this very feature means that these policies may offer limited environmental gains. Along these lines, the most popular policies chiefly follow recycling or substitution (e.g., bioplastics) principles, and not the reuse or reduction of plastic products. Even though the latter is deemed to be more materially efficient, providing higher environmental gains. Green public procurement (+79%), greening mass balance (+77%),

and state investments in green production (+74%) are formulated either as economic incentives or as regulatory demands, but are directed towards industry, and are creative leaning, with a focus on subsidies and the creation of new niche markets for more sustainable alternatives (Kivimaa & Kern 2016). Policies of this kind commonly receive higher public support than policies aimed at disrupting current unsustainable practices. Extending the deposit-refund system (+79) stands out among the more popular policies as being one with a clear economic incentive directed towards consumers, rewarding desired material management and indirectly punishing undesired material management. As such, it is a bit surprising to see its relatively high support across the board.

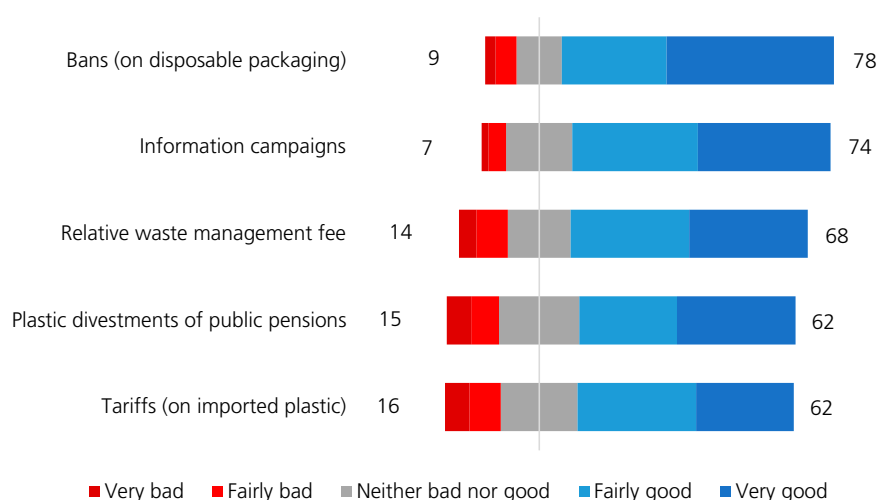


Figure 7B Moderate support policies (percentage)

Note: Proportions on the right show the total share of responses for the options “very good proposal” and “fairly good proposal”; proportions on the left show the total share of responses for the options “fairly bad proposal” and “very bad proposal”. The percentage base consists of those who answered the question. Number of respondents differs between the proposals, from 1 069 to 1076.

The next segment of this analysis focuses on moderately supported plastic policies (Figure 7B). “Moderately supported” might be a misleading term, since all these policies still receive relatively high support. The set of policies in Figure 7B has a net balance of opinion between +46% and +69%, and consists of a range of policy types. Given the soft character of information campaigns, it is somewhat surprising that this option does not receive as high support as the other types of soft policies proposed. Relative waste management fees (+54%) is a policy with an economic incentive, aimed at incentivising households to sort more of their waste overall, and to sort it

more accurately. Like the deposit-refund scheme, it might be more popular than taxes or bans as it might be seen as punishing only those who do not behave accordingly, rather than burdening all consumers. One of the more far-reaching proposals is to implement tariffs on fossil-based plastic and feedstock imported into the EU. This policy receives surprisingly high support among respondents to our survey (+46%). This suggests that the Swedish public might express broad support for the inclusion of petrochemicals in the current negotiations around the Carbon Border Adjustment Mechanism (CBAM) within the European Union.

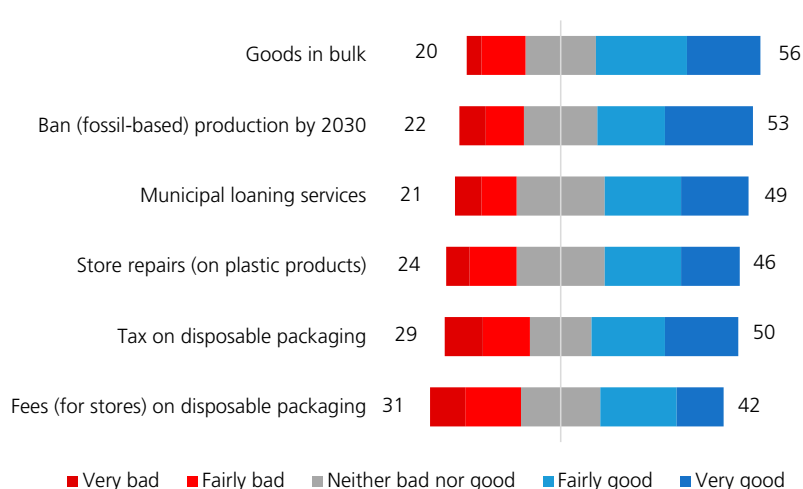


Figure 7C Lower support policies (percentage)

Note: Proportions on the right show the total share of responses for the options “very good proposal” and “fairly good proposal”; proportions on the left show the total share of responses for the options “fairly bad proposal” and “very bad proposal”. The percentage base consists of those who answered the question. Number of respondents differs between the proposals, from 1 069 to 1 074.

Figure 7C contains the relatively less-supported plastic policy proposals in our survey. This segment of proposals gains net support between +11% and +36%. Although all policies receive more support than opposition, these proposals are met with stronger opposition, although general confirmation bias should also be considered. These factors make the result for these policies a bit more ambiguous. A commonality among these policies is that they are aimed at pushing more environmentally efficient reuse of materials, and the reduction of consumption. This in turn implies more significant interventions into current consumption-intensive lifestyles, and thus might be expected to meet with more resistance. The most far-reaching proposal in the survey was to ban virgin-fossil-based plastic production by 2030 (+31%), a proposal that certainly entails a number of serious consequences for our current habits. In devising this policy, we set 2030 as a goal date that we thought most likely to seem feasible and concrete, but not too abrupt a change. The least popular among the policies was a mandatory fee on any disposable packaging that could not be returned to a deposit-refund scheme or to the grocery store after use, with the fee to be payable not by consumers but by grocery stores (+11%). Also relatively unpopular was a general tax on disposable packaging (+21%). Perhaps the wide reach of such policies seemed daunting or unfeasible to some respondents; certainly, fees and taxes of all kinds carry a political valence that is likely to make them unpopular among some sectors of Swedish society.

DIFFERENTIATED SUPPORT TOWARDS POLICIES?

Although we did expect an overall approval of a majority of the proposals, it is noteworthy that none of the policies proposed returned a net negative popularity rating – in other words, every proposal, no matter how far-reaching or how onerous for the consumer, was approved by a majority of respondents. But before we can conclude that there is widespread acceptance of plastic regulation among the Swedish public, we need to examine potential differences between demographic groups. By comparing those in favour of the policies through statistical proportion analysis, we can test whether different groups display

similar attitudes or not. In table 5-10, potential group differences based on gender, age, education, income, place of residence, left-right affiliation, and party preference are examined. The tables show the proportions of respondents in favour of the proposed policies (fairly and very good proposal), the proportions of positive replies for each subgroup, and the proportional difference between the reference and the compared subgroup(s). Statistically significant differences are indicated by stars. Positive values imply a larger share of respondents who favour a policy among the subgroup, compared to the reference group. Conversely, a negative value indicate less support among the subgroup compared to the contrasting reference group. The variable “all” shows the percentage of all respondents in favour of the proposals (fairly or very good proposal).

In table 5, potential differences in opinions on plastic policies between women and men are presented. The results of the proportion tests show that women are significantly more positive about all policies compared to men (the policy proposal on tariffs is the only policy with non-significant results). The largest difference in opinion is visible in the proposals ‘ban fossil-based production by 2030’ and ‘municipal loaning services’. Here, women are 20% more positive about the proposals than men are, and the proportional differences are statistically significant. The smallest differences between women and men are for the policies ‘recyclable new plastic products’ (4% difference), ‘extended deposit-refund system’ (5% difference), and ‘greening mass balance’ (6 % difference). Though proportions are statistically significant, the differences are relatively small, indicating comparatively greater coherence in attitudes between the groups than for other policies. Established practices such as recycling, and deposit-refund system developments gain similar support among women and men. Regulations limited to the production process, which demand little change on the part of individuals, gain support among both groups. Conversely, regulations with financial elements, such as tariffs and municipal investments (loaning services), are cause for larger attitudinal differences between women and men.

Table 5 Opinions on plastic policy proposals by gender (percentage, percentage difference)

(Fairly or very good proposal)	All	Woman	Man	ΔW-M
High support policies				
Standardized recycling information on plastic products	90	93	87	+6***
Recyclable new plastic products	90	92	88	+4*
Green public procurements	84	90	79	+11***
Extended deposit-refund system	83	86	81	+5*
Greening mass balance	82	85	79	+6*
Source separation of public waste bins	80	85	75	+10***
State investments in green production	80	84	76	+8**
Moderate support policies				
Bans (on disposable packaging)	78	83	72	+11***
Information campaigns	74	81	68	+13***
Relative waste management fee	68	74	62	+12***
Plastic divestments of public pensions	62	71	53	+19***
Tariffs (on imported plastic)	61	65	58	+7
Lower support policies				
Goods in bulk	56	60	52	+8*
Ban (fossil-based) plastic production by 2030	53	63	43	+20***
Municipal loaning services	49	59	39	+20***
Store repairs (on plastic products)	46	52	39	+13**
Tax on disposable packaging	50	56	44	+12**
Fees (for stores) on disposable packaging	43	48	37	+11*

Note: The question was: "The following are examples of measures which could contribute to reducing the negative environmental effects linked to plastic. What do you think about the measures?" The table shows those who responded fairly or very good on the proposed plastic policy proposals. The response options were "very good proposal", "fairly good proposal", "neither good nor bad proposal", "fairly bad proposal", and "very bad proposal". Reference category: women. Significance levels: *p < 0,05 ** p < 0,01 *** p < 0,001.

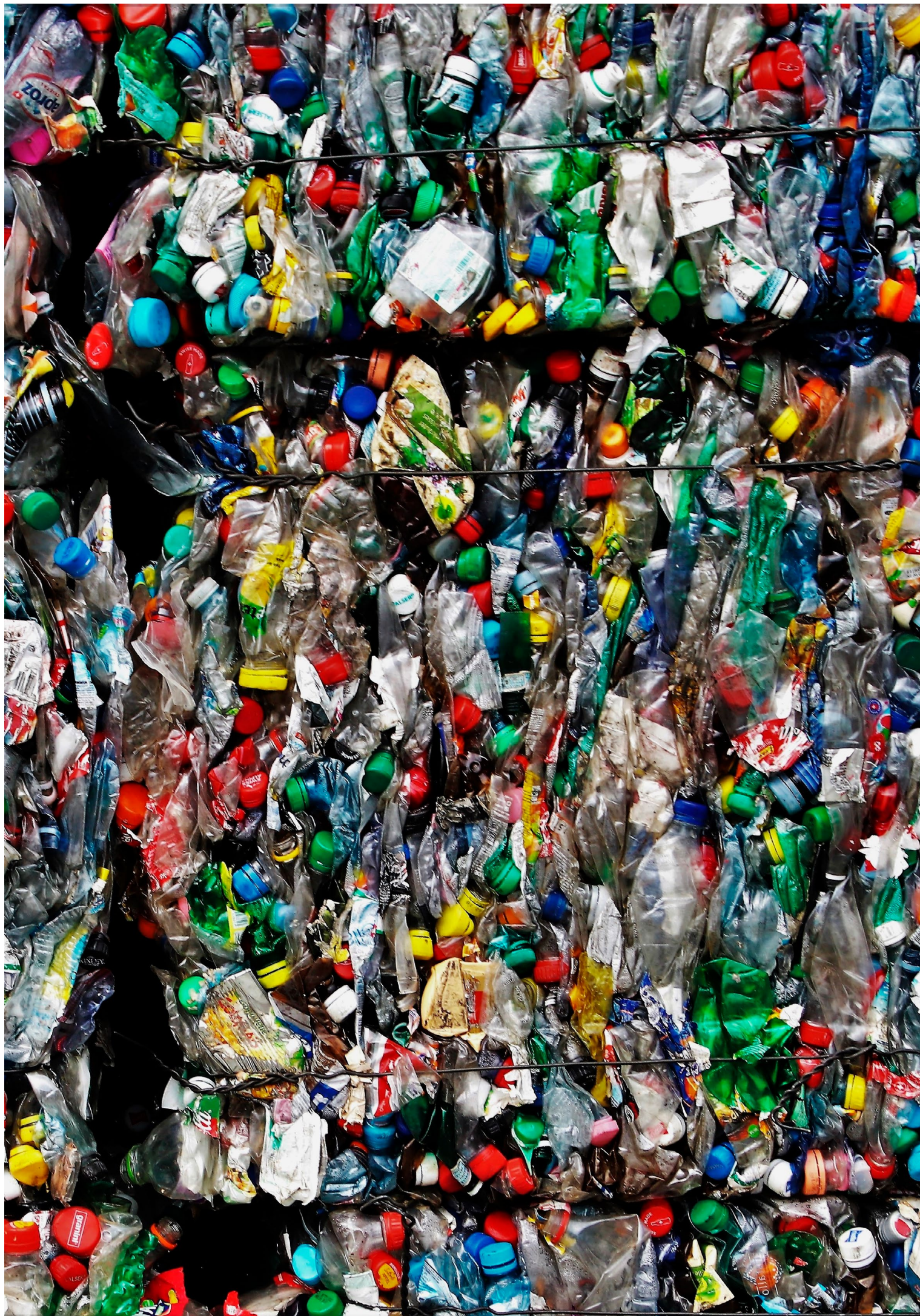
Table 6-9 shows differences based on age, education, income, and place of residence. As indicated by the lack of significant differences, opinions on plastic differ only to a very small degree when these variables are taken into account. Between age groups, there is only statistical difference among the youngest age cohort and ages 50-69, for the policy 'extended deposit-refund system', with the 50-69 age group being 10% more positive towards the policy than the youngest. Though not statistically significant, other notable differences include the proposal on store repairs, for which the youngest age group show more support than do older cohorts, and fees (for stores) on disposable packaging, about which the older age groups appear more positive than the youngest group.

Table 8 shows potential differences between income groups where the highest income group (37 000 SEK or more/month) is used as a reference. Overall, lower income groups appear to be more positive than the

highest income groups about most of the policies. However, there are few statistically significant differences between income groups. Significant differences are measured between the middle-income group (19 000-36 999 SEK/month) and the reference group in five instances. This includes soft policies such as standardised recycling information and an extended deposit-refund system; and public investment proposals such as green procurements, municipal loaning services, and green public pension investments. Likewise, lower income groups are more positive about green state investments than the highest income group – differences which might be linked with political ideology. Between the lowest and highest income brackets, statistical differences are present for the policy 'plastic divestment of public pensions.

Based on education, significant differences are measured between high and medium-low education groups for two policies: tariffs, and a tax on disposable packaging.⁵ Much like the differences measured

5. Note that even though the percentual difference is larger between the high and low education groups for the proposals on tariffs (-20%) and tax on disposable packaging (-16%) than between the high and medium-low groups (-11% for tariffs and tax), significant differences are only measured between the high and medium-low groups. The absence of significant differences between the low and high education groups is likely explained by low frequency among the low education group, which causes large standard errors and thus also increases the level of uncertainty.





between income groups, attitudes between education groups seem to be concentrated around economic policies. These similarities are plausibly explained by correlations between socioeconomic variables, such as education and income, and are likely also influenced by political preferences.

There are few geographical differences, which suggests little difference in views on plastic between rural and urban areas. Statistical differences are only visible in three policies. Between people in large cities and

smaller towns, statistically significant differences are measured for 'plastic divestments of public pensions' (16%), 'ban plastic production by 2030' (17%), and 'tax on disposable packaging' (14%). Between people in large cities and people in cities/larger towns, there are significant differences for the proposal 'ban plastic production by 2030' (11%). In all these cases, large city residents are more positive towards the mentioned measures. There is no statistical significance between the category rural residents outside small towns and large city residents in any of the policies.

Table 6 Opinions on plastic policy proposals by age (percentage, percentage difference)

(Fairly or very good proposal)	All	(Ref.) < 30	Δ<30- 31-49	Δ< 30- 50/69	Δ<30- ≥ 70
High support policies					
Standardized recycling information on plastic products	90	92	-3	-3	±0
Recyclable new plastic products	90	88	+5	+2	±0
Green public procurements	84	87	-4	-3	-2
Extended deposit-refund system	83	76	+8	+10*	+6
Greening mass balance	82	78	+4	+5	+4
Source separation of public waste bins	80	82	+4	-2	-10
State investments in green production	80	82	+1	-1	-7
Moderate support policies					
Bans (on disposable packaging)	78	73	+2	+5	+10
Information campaigns	74	70	+1	+6	+7
Relative waste management fee	68	65	+3	+4	+3
Plastic divestments of public pensions	62	63	+3	-5	+3
Tariffs (on imported plastic)	61	62	+4	-6	+2
Lower support policies					
Goods in bulk	56	55	-3	+3	+3
Ban (fossil-based) plastic production by 2030	53	57	-4	-3	-6
Municipal loaning services	49	53	±0	-5	-9
Store repairs (on plastic products)	46	54	-4	-11	-13
Tax on disposable packaging	50	51	-1	-2	+1
Fees (for stores) on disposable packaging	43	34	+14	+6	+9

Note: The question was “The following are examples of measures which could contribute to reducing the negative environmental effects linked to plastic. What do you think about the measures?” The table shows those who responded “fairly good” or “very good” on the proposed plastic policies. The response options were “very good proposal”, “fairly good proposal”, “neither good nor bad proposal”, “fairly bad proposal”, and “very bad proposal”. Reference category: 30 years or younger. Significance levels: *p < 0,05 ** p < 0,01 *** p < 0,001.



Table 7 Opinions on plastic policy proposals by education (percentage, percentage difference)

(Fairly or very good proposal)	All	Δ High- Low	Δ High-Medium low	Δ High-Medium high	(Ref.) High
High support policies					
Standardized recycling information on plastic products	90	-6	+1	±0	90
Recyclable new plastic products	90	-13*	±0	-1	91
Green public procurements	84	-4	±0	+2	82
Extended deposit-refund system	83	-1	+1	+1	83
Greening mass balance	82	+2	±0	+3	81
Source separation of public waste bins	80	-11	-1	±0	81
State investments in green production	80	-13	-3	-4	83
Moderate support policies					
Bans (on disposable packaging)	78	-6	-1	-3	79
Information campaigns	74	-3	+1	+4	73
Relative waste management fee	68	-8	±0	+5	67
Plastic divestments of public pensions	62	-8	-7	±0	65
Tariffs (on imported plastic)	61	-20	-11*	-1	66
Lower support policies					
Goods in bulk	56	+3	+1	+5	54
Ban (fossil-based) plastic production by 2030	53	-7	-3	-4	56
Municipal loaning services	49	-6	+1	-1	49
Store repairs (on plastic products)	46	-5	-2	-5	48
Tax on disposable packaging	50	-16	-11*	±0	54
Fees (for stores) on disposable packaging	43	-9	-11	-2	47

Note: The question was "The following are examples of measures which could contribute to reducing the negative environmental effects linked to plastic. What do you think about the measures?" The table shows those who responded "fairly good" or "very good" on the proposed plastic policies. The response options were "very good proposal", "fairly good proposal", "neither good nor bad proposal", "fairly bad proposal", and "very bad proposal". Education, Low = up to primary school or equivalent; Medium-low = up to high school or equivalent; Medium-high = Post-secondary education, college/university less than 3 years; High = College/University education, 3 years or longer. Reference category: High education. Significance levels: *p < 0,05 ** p < 0,01 *** p < 0,001.

Table 8 Opinions on plastic policy proposals by income (percentage, percentage difference)

(Fairly or very good proposal)	All	Δ High-Low	Δ High-Medium	(Ref.) High
High support policies				
Standardized recycling information on plastic products	90	-1	+5*	88
Recyclable new plastic products	90	+1	+2	89
Green public procurements	84	+5	+9**	79
Extended deposit-refund system	83	+2	+7*	80
Greening mass balance	82	-1	±0	83
Source separation of public waste bins	80	+1	±0	80
State investments in green production	80	+4	+5	77
Moderate support policies				
Bans (on disposable packaging)	78	+4	+4	75
Information campaigns	74	+7	+2	72
Relative waste management fee	68	+4	+3	66
Plastic divestments of public pensions	62	+11*	+10*	56
Tariffs (on imported plastic)	61	+2	±0	61
Lower support policies				
Goods in bulk	56	+10	+8	50
Ban (fossil-based) plastic production by 2030	53	+8	+8	48
Municipal loaning services	49	+15*	+10	41
Store repairs (on plastic products)	46	+7	+9	40
Tax on disposable packaging	50	+1	+4	48
Fees (for stores) on disposable packaging	43	+3	+2	41

Note: The question was: "The following are examples of measures which could contribute to reduce the negative environmental effects linked to plastic. What do you think about the measures?" The table shows those who responded "fairly good" or "very good" on the proposed plastic policies. Income is based on a 13-point scale and has been recoded into a three-point scale where Low (1–5) = less than 4 000–18 999 SEK, Medium (6–9) = 19 000 – 36 999 SEK, high (10–13) = 37 000 SEK or more. Reference category: High income. Significance levels: *p < 0,05 ** p < 0,01 *** p < 0,001.

Table 9 Opinions on plastic policy proposals by place of residence (percentage, percentage difference)

(Fairly or very good proposal)	All	(Ref.) Large city	L. city - City/l. town	L. city -Smaller town	L. city -Rural area
High support policies					
Standardized recycling information on plastic products	90	90	±0	±0	±0
Recyclable new plastic products	90	88	+4	+3	+1
Green public procurements	84	83	+3	-1	+2
Extended deposit-refund system	83	82	+3	-1	+3
Greening mass balance	82	82	±0	-3	+5
Source separation of public waste bins	80	82	-1	-5	-4
State investments in green production	80	79	+1	+2	+4
Moderate support policies					
Bans (on disposable packaging)	78	75	+3	+3	+5
Information campaigns	74	74	+1	+2	-3
Relative waste management fee	68	68	-4	+2	+6
Plastic divestments of public pensions	62	69	-7	-16**	-7
Tariffs (on imported plastic)	61	64	-2	-9	-3
Lower support policies					
Goods in bulk	56	55	-1	+3	+6
Ban (fossil-based) plastic production by 2030	53	61	-11*	-17**	-7
Municipal loaning services	49	49	+1	-2	+1
Store repairs (on plastic products)	46	46	±0	-2	±0
Tax on disposable packaging	50	54	-2	-14*	-7
Fees (for stores) on disposable packaging	43	45	-4	-6	+1

Note: The question was: "The following are examples of measures which could contribute to reduce the negative environmental effects linked to plastic. What do you think about the measures?" The table shows those who responded "fairly good" or "very good" on the proposed plastic policies. Residence is based on a seven-point scale and has been recoded into a four-point scale where 1–2 = Large city, 3–5 = City/larger town, 6 = Smaller town, 7 = Rural area. Reference category: Large city. Significance levels: *p < 0,05 ** p < 0,01 *** p < 0,001.

Table 10 shows plastic policy opinions by left-right self-placement, with people to the left as a reference group which is compared to people to the right and people neither to the left nor right. There are significant differences in opinions between people on the political scale throughout almost all policy proposals. Overall, the largest differences are visible between people to the left and to the right of the political scale. Throughout all proposed policies, people to the left are more positive than people to the right, with differences ranging from 5% (standardised recycling information) to as much as 39% (tax on disposable packaging). Similarly, people in the political centre are comparatively less positive about the proposed policies than people on the political left. Here, attitudinal differences range from 6% (recyclable new plastic products) to 19% (tax on disposable packaging).

Overall, the largest statistical differences are visible among economic policy instruments such as tariffs, taxes, and fees, and regulatory policies such as bans. Additionally, policies which are comparatively less established (e.g., goods in bulk, municipal loaning services, and store repairs on plastic products) gain overall lower support and see larger differences between people that affiliate themselves with the left or the right. The smallest differences are seen among soft and established policies, such as recycling- and waste-management-related measures, substitution, and various subsidies. These policies place relatively low requirements on the individual to change. Overall, there are large and statistically significant differences among many of the proposals based on left-right self-placement, which suggests that opinions on plastics have become politicised. These political cleavages are examined further in table 11, in which differences in opinion by party preference are presented.

Table 10 Opinions on plastic policy proposals by ideology (percentage, percentage difference)

(Fairly or very good proposal)	All	(Ref.) Left	Δ Left- Neither L/R	Δ Left-Right
High support policies				
Standardized recycling information on plastic products	90	92	+1	-5*
Recyclable new plastic products	90	96	-6**	-11***
Green public procurements	84	93	-9***	-17***
Extended deposit-refund system	83	88	-7*	-6
Greening mass balance	82	89	-7*	-14***
Source separation of public waste bins	80	85	-5	-8*
State investments in green production	80	87	-4	-18***
Moderate support policies				
Bans (on disposable packaging)	78	89	-11***	-24***
Information campaigns	74	84	-9**	-21***
Relative waste management fee	68	75	-8	-12**
Plastic divestments of public pensions	62	79	-16***	-35***
Tariffs (on imported plastic)	61	76	-15***	-29***
Lower support policies				
Goods in bulk	56	71	-16***	-28***
Ban (fossil-based) plastic production by 2030	53	69	-15***	-32***
Municipal loaning services	49	66	-18***	-32***
Store repairs (on plastic products)	46	59	-15**	-23***
Tax on disposable packaging	50	69	-19***	-39***
Fees (for stores) on disposable packaging	43	56	-14**	-25***

Note: The question was: "The following are examples of measures which could contribute to reducing the negative environmental effects linked to plastic. What do you think about the measures?" The table shows those who responded "fairly good" or "very good" on the proposed plastic policies. The response options were "very good proposal", "fairly good proposal", "neither good nor bad proposal", "fairly bad proposal", and "very bad proposal". Left-right self-placement is based on an 11-point scale and has been recoded into a three-point scale where 0–3 =left, 4–6= neither to the left nor right, 7–10 = right. Reference category: Left. Significance levels: *p < 0,05 ** p < 0,01 *** p < 0,001.

The possible politicisation of plastic policies is confirmed when testing political differences based on party preference. As seen in table 11, there are significant differences between the reference group (all fairly or very positive towards policy), and parties traditionally positioned on the left and right of the political scale. Note that the Liberal Party (L) and the Christian Democratic Party (KD) have been excluded from the proportion tests due to low frequencies.

The largest differences in comparison to the reference group are found among Green Party (MP) and Left Party (V) supporters, who are the most positive, and Sweden Democrats (SD) supporters, who are most negative. The policies which cause the greatest divides relate to regulatory and economic policy instruments such as taxes, bans, fees, and tariffs. Among the most notable differences, Green Party and Left Party supporters are much more positive about economic policies, and regulations which require individual behaviour change. Supporters of the Green Party and Left Party are more positive than the average about a

plastic tax, green public pension investments, tariffs, fees, and buying goods in bulk, with proportional differences ranging between 18 and 30%. Among supporters of the Social Democratic Party (S), the Centre Party (C), and the Moderate Party (M) differences are less distinct, although there are relevant statistical divergences. Overall, supporters of the Social Democratic Party (S) are comparatively more positive towards all policies than the average, with statistically significant differences among a third of all proposals. These policies encompass various regulation types and include soft policies such as information strategies, strong policies such as bans, and economic regulations such as taxes and public investments (green public procurements). The relatively high support for green taxes and procurements is plausibly explained by ideological inclinations, as Social Democrats traditionally favour economic policy instruments and tax increases.

Differences from the average for the Centre Party (C), are less prominent, with only one policy showing a statistically significant difference ('state investments in

green production', +10%). Nonetheless, Centre Party supporters are proportionally more positive throughout all proposals compared to the average, although differences are not significant. Supporters of the centre-right Moderate Party (M) and the right-wing Sweden Democrats (SD) are most negative towards plastic policies, with negative proportions throughout all proposals compared to the average. However, for Moderate Party supporters, statistically significant differences are only gauged in two instances. These policies (tax on disposable packaging, and plastic divestments of public pensions) have strong economic incentives and can plausibly be linked to ideological inclinations, since the Moderate Party traditionally oppose certain government regulations and economic policy instruments.

Among Sweden Democrats supporters, opinions on plastic policies differ significantly from the average in almost all instances, and negative inclinations are gauged throughout all policies. Significant differences range from 14% up to as much as 33% (tax on disposable packaging) and include a wide range of policy types. The least popular policies encompass regulatory and economic instruments such as taxes, bans, and fees, and soft instruments like information campaigns and loaning services. The extensive dislike throughout all policies suggests opposition to environmental policies in general, which corresponds to the overall position of the party on environmental issues.

Table 11 Opinions on plastic policy proposals by party preference (percentage, percentage difference)

(Fairly or very good proposal)	(Ref)All	Δ all-MP	Δ all-V	Δ all-S	Δ all-C	Δ all-M	Δ all-SD
High support policies							
Standardized recycling information on plastic products	90	+3	+1	+7***	+1	-1	-14***
Recyclable new plastic products	90	+6	+8	+5	+7	-4	-9
Green public procurements	84	+14**	+6	+7**	+7	-2	-19***
Extended deposit-refund system	83	+6	+4	+4	+6	+2	-4
Greening mass balance	82	+9	+11***	+5	+1	-1	-15***
Source separation of public waste bins	80	±0	+11**	+1	+6	-5	-8
State investments in green production	80	+7	+9*	+4	+11*	+2	-23***
Moderate support policies							
Bans (on disposable packaging)	78	+15**	+11**	+8**	+6	+3	-24***
Information campaigns	74	+13*	+3	+13***	+3	-2	-26***
Relative waste management fee	68	+12	+8	+5	-3	+2	-16**
Plastic divestments of public pensions	62	+27***	+23***	+7	+8	-11*	-25***
Tariffs (on imported plastic)	61	+24***	+18***	+6	+11	-7	-19**
Lower support policies							
Goods in bulk	56	+23**	+18***	+6	+9	-12	-12
Ban (fossil-based) plastic production by 2030	53	+25**	+26***	+5	+6	-12	-22**
Municipal loaning services	49	+12	+20***	+8	+8	-11	-20*
Store repairs (on plastic products)	46	+21*	+19***	+1	+5	-8	-15
Tax on disposable packaging	50	+30***	+24***	+10*	+11	-16*	-33**
Fees (for stores) on disposable packaging	43	+24**	+18**	±0	+10	-6	-21*

Note: The question was: "The following are examples of measures which could contribute to reduce the negative environmental effects linked to plastic. What do you think about the measures?" The table shows those who responded "fairly good" or "very good" on the proposed plastic policies. The Liberal party and the Christian Democratic party were excluded from the analysis due to low response counts. Reference category: All (Proportion fairly or very good proposal). Significance levels: *p < 0,05 ** p < 0,01 *** p < 0,001.

Attitudes towards textile-related policies

Textiles are a sector where plastics have been increasingly used in recent decades. We therefore decided to include a section of the questionnaire on textile-related plastics policies specifically. This increased use, along with a fast rate of replacement of items, makes textiles one of the more prominent sectors in which plastic use is problematically unsustainable (Ellen MacArthur Foundation 2017). The textile sector is therefore a sector that is likely to be subject to near future policymaking to address these issues. However, the fact that much of our textiles today are made from plastics is less widely publicised than other short-term uses of plastic and might not be known to many of the respondents.

In this section of the survey, we put forward a battery of five policy proposals in relation to textiles (Figure 8). Overall, the pattern follows the responses to the 18 questions above. Subsidising more environmentally friendly consumption through decreasing VAT on clothing repairs (+78%) and on second-hand wares (+66%) are popular measures. The idea of providing a separate source separation bin for clothing in the garbage rooms of apartment blocks is likewise popular (+72%). A deposit-refund scheme system for clothing gets substantially lower support (+28%) compared to the policy suggestion in the section above on an extension of the deposit-refund scheme system to include more packaging (+79%). This might indicate doubt around how such a system would work in

practice, as it is something that, unlike the deposit-refund scheme on some beverage packaging, has not been tried out on a large scale in Sweden. An error was made in the formulation of the question on VAT on second-hand clothing since, in reality, the VAT on most second-hand clothing in Sweden is zero. Since 2016, there is no VAT for non-profit actors, which today dominate the second-hand market (Skatteverket 2018). The question could therefore be interpreted as high support for the current VAT rate, and a potential support for the inclusion of second-hand sales on commercial ground into the same zero VAT rate. The only policy which receives a net negative balance of opinion is an increase on the VAT on new clothes (-9%). This could be related to an impression that an increased VAT is a direct punishment of consumers who, in a “fast fashion” culture, are left without many viable options. Additionally, increasing flat VAT rates would disproportionately affect low and middle-income earners, which might contribute to its disapproval. In textiles as elsewhere, it seems clear that “carrot” policies of subsidising environmentally friendly consumption are more popular than “stick” policies such as increased taxes. However, sticks cannot be ignored, as a balanced spread of policies – some encouraging and some punishing – will likely be more effective overall in changing unsustainable consumption practices, compared with introducing only the more popular “carrot” style of policy.

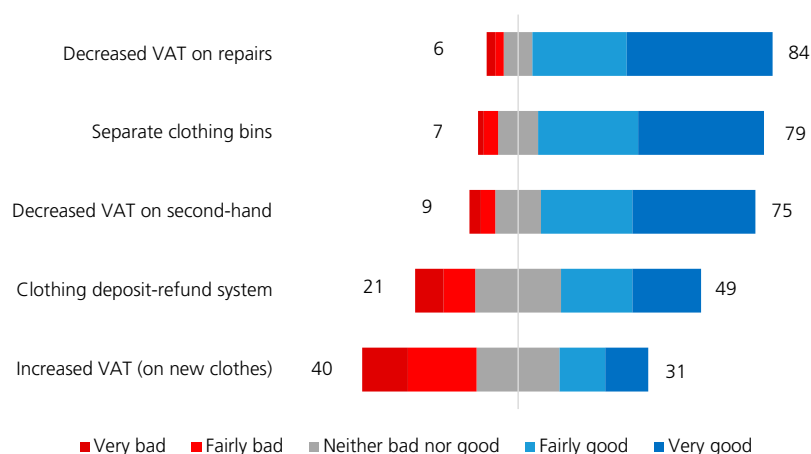


Figure 8 Opinions on textile policy proposals (percentage)

Note: Proportions on the right shows the total share of responses for the options “very good proposal” and “fairly good proposal”; proportions on the left show the total share of responses for the options “fairly bad proposal” and “very bad proposal”. The percentage base consists of those who answered the question. Number of respondents differs between the proposals, from 1 067 to 1 072.

Policy measures

In the last section of the survey, we asked respondents to choose up to three measures, out of a list of nine, that they considered most efficient for reducing the environmental impact of plastic packaging. The

term ‘packaging’ was chosen as the object for the measures, to make the policies more concrete for the respondents (see Figure 9).

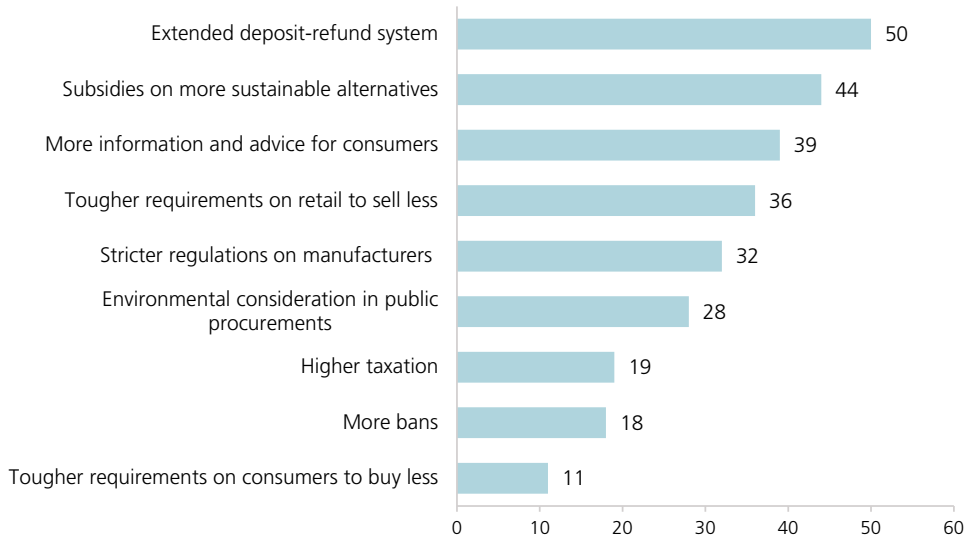


Figure 9 Most efficient measures to reduce negative environmental effects of plastic packaging (percentage)

Note: The question was: “Which of the following measures do you think are the most effective in reducing the negative environmental effects associated with plastic packaging?” Respondents could choose up to three alternatives. A list of the full phrasing of all question alternatives can be found in the appendix. The percentage base consists of those who answered the question. Number of respondents: 1 064.

Of all the options, an extended deposit-refund scheme system was most frequently chosen, with 50% of all the respondents choosing this alternative as one of their options. Subsidies on alternative packaging was the second most chosen measure, with 44% of the respondents selecting it. Thereafter, in descending order with a gap of a three to five percent difference, were: more information and advice to consumers (39%); tougher requirements on retail to sell less packaging (36%); stricter regulation on manufacturers (32%); and that the environmental impact of plastic packaging is considered in the public procurement of governmental bodies (28%) were the most picked options. A considerable gap can then be seen, down to the higher taxation of packaging (19%), bans on more categories of plastic packaging (18%), and lastly, tougher demands on consumers to consume less packaging (11%). This order follows the pattern seen in the balance of opinion of the 18 policy proposals of Table 4, wherein soft-leaning and (some) economic policy instruments gained higher approval. Here, similar approaches such as the subsidisation of

alternatives, deposit-refund scheme systems, and more consumer information, are considered more effective in addressing the negative environmental impacts of plastics. Thereafter, there are a set of instruments that 28–36% chose, including more regulation of retailers with regard to packaging options in stores; stricter regulations on manufacturers; and more environmental considerations in public procurement. The alternatives chosen by the fewest are also more regulatory- or economic-leaning, but place more emphasis on the consumer, instead of on manufacturers, retailers, or public authorities. This could be interpreted in different ways: either the respondents think that the most efficient punitive measures are the ones aimed at manufacturers, retail, and authorities, rather than at individuals and consumers; or that punitive measures aimed at consumers are less palatable to respondents, and so were also rejected as less effective.

The fact that softer-leaning instruments are regarded by some as the most efficient policy measures could indicate that many respondents underestimate the

scale of the issue – in reality, more far-reaching policies likely will be required in the long run. Another explanation could be that many respondents are unwilling to adapt to necessary behavioural changes. Alternatively, it could indicate an awareness of the political and practical difficulties associated with pushing through policies that more directly clash with prevalent status quo interests in society. However, it is important to recognise that some measures stand out in this

regard, with the extended deposit-refund scheme system being the most frequently chosen measure among the respondents. This is a measure which in effect punishes undesired material handling and reward desired material handling. The popularity of this measure therefore goes against the more general trend. Further investigation into why this might be the case could be a fruitful direction for future research.



The next STEPS: Governing plastic in the 2020s

As we enter the 2020s, it is clearer than ever that plastics are creating a number of serious environmental issues, and our unsustainable omnipresent use of the material must be addressed. This insight has been made possible partly by the increased attention given to plastic in the global media in recent years. Further policymaking in this area is expected, and the European Commission has through its plastic strategy and EU Green Deal, indicated that the EU and its member states will address plastics through various policy instruments in the near future. However, it is important to evaluate whether the populations of the member states have the appetite for the kinds of changes that the expected legislation will seek to introduce. After all, the power of the political elite to effect change is deeply dependent on the public's support for a given policy trend.

In this report, in which we have examined a set of questions around plastic for Swedish citizens, we can see some clear tendencies. Swedes generally consider plastics to be a serious environmental issue, while acknowledging that there are benefits connected to its use, which makes the public's relationship to plastic ambiguous and bittersweet. Overall, the respondents think that the plastic industry itself has the biggest responsibility to address these issues, followed by individuals as a collective, and the EU and its institutions.

The survey results on the topic of the much-debated plastic bag tax can be interpreted in different ways. It might be seen as an indicator of how plastic objects can be politicised, not to say weaponised, to the advantage of certain interest groups and political forces. In this sense, the plastic bag tax can be seen as a warning of future challenges in which attitudes to plastic are polarised along left-right and other dividing lines. Nevertheless, despite heated public debate and tendencies toward polarised views, a small majority of respondents declares support for the policy, while only a third of respondents oppose the policy. This could potentially indicate that policymakers should *not* be too afraid to act, as the public may support, or adapt over time to, more comprehensive measures, even if these provoke vocal resistance in the early stages. However, introducing such policies may be a balancing act: too much change too quickly could mobilise opposition and create polarisation. While regulating plastic bags in one sense is merely the tip of the ice-

berg and in fact only a trial balloon since our current society is filled with unsustainable material practices.

Respondents' opinions of the range of policies proposed in this survey give us an indication of paths forward in plastic policymaking in the 2020s. It would seem that there is almost unanimous approval of policies that are soft-leaning, and of economic policies that are nudging, non-punitive, and incremental. Recycling and substitution are currently far more easily accepted than reduction and reuse. Policies to improve recycling are likely to meet with less political resistance and therefore be more straightforward to implement. Recycling might therefore be a useful area on which to focus, in order to prepare the public for more radical behavioural change in other areas of the plastic system. Respondents seemed more open to economic measures when the policy is related to recycling. Differentiated fees for source separated waste, and an expansion of the deposit-refund scheme are key examples, however these examples encompass not only a "stick" but also a "carrot" element, whereby persons which act as desired, receive financial benefits. Such economic driven policies might offer a more straightforward path to the actual degree of behavioural change that will be needed to properly address this crisis in coming years. Once such policy approaches become more familiar to the public through recycling improvement initiatives, the public may accept similar policies in other areas. A key takeaway of this research, then, is that there is plenty of political leeway to improve recycling infrastructure and engage citizens in a more advanced recycling agenda.

In the long run, recycling alone will not be able to push the plastic system into sustainability. More far-reaching reforms that focus on reuse and reduced use will therefore be necessary to consider in the imminent future. The more far-reaching policies of this type that were included in the survey did gain support among respondents, but to a lesser degree. Similarly, some of the softer-leaning policy measures were regarded as being more efficient in the last question around efficiency of policy instruments in tackling the issues connected to plastic packaging. This might signal that many respondents either underestimate the scale of the issue or for that matter are unwilling to accept necessary changes in how we use plastics in our day-to-day lives. An exception might be the proposal of tariffs on imported fossil-based plastic to

the EU, which gained a larger share of support than we had expected. This means that Swedes would likely support the inclusion of petrochemical products in the Carbon Border Adjustment Mechanism that is currently being negotiated. If pursued, this could open for a more comprehensive inclusion of the petrochemical industry into the EU ETS without the degree of free allowances it is subsidised with today. In length this could make alternatives to petroplastic more competitive in the coming years and incentivise other types of material practices. A total ban on fossil-based plastic by 2030 is also met with more support than opposition among respondents; the question remains as to how feasible and desirable such a policy is in such a short timeframe.

Who, then, are the typical supporter and the typical opponent of plastic policymaking? There are a couple of background variables that indicate clear differences among the demographics. Gender stands out as the clearest defining background variable, with women across the board indicating higher support for plastic regulation, while men indicate higher opposition to the same. Ideological inclinations also indicate clear fault lines, with the highest support found among Green party and Left party sympathisers, declining across the party spectrum to the lowest levels of support among sympathisers of the right-wing Sweden Democrats. A similar tendency is seen on the spectrum of individuals' left-right political self-identification: people on the political left support the policy proposals to a higher extent than people positioned on the political right. However, these background variables are interlinked, as women in Sweden are more likely than men to vote for parties on the left and position themselves on the left of the political spectrum. Differences based on other background variables such as age, education, income, and place of residence are less marked. Although income and education tentatively might indicate some differences, with low to middle income earners and highly educated respondents being somewhat more supportive to the policy proposals. However, these variables are also partly interlinked with left-right self-identification.

Cleavages on the left-right spectrum are most distinct among the more far-reaching policies. Yet these are the policy types that are most likely to be effective in addressing the deeper, more culturally-ingrained aspects of the plastic problem, such as overconsumption and throwaway culture. It is therefore important to work towards building acceptance of more far-reaching policy approaches among groups who currently oppose them. It may be necessary to frame issues of plastic pollution and other environmental issues in terms of the values and identities with which these groups associate themselves. For example, the conservative ideal of stability could be applied to the issue of future livelihoods and lifestyles, which will be threatened if we do not thoroughly address the coming environmental crises (plastics being one of these crises). Right-wing support for economic liberal principles of pricing externalities could be mobilised, or elements of national romanticism could be thrown into the communication around the threats that plastics presents to wildlife and sceneries. In short, the debate around plastic cannot be allowed to be polarised on the basis of the surface features of this or that policy – more far-reaching narratives of sustainable plastic management, and bigger questions about the world we want to live in in the future, must take hold in the public conversation. To use an analogy, the weak ecological modernisation model of plastic policymaking needs to move toward a stronger model in due time (Christoff 1996), whereby the limitations created by environmental degradation are treated as a given in how we organise society. Limitations can spur creativity and resilience, but only once they are faced. In this society, long-term change in collective material practices and individual behaviour will be essential. The necessary changes cannot be realised without the public's support. Compelling and realistic visions of future sustainable material use will therefore be crucial in creating acceptance and desire for a day-to-day way of living where long-term sustainability is ingrained in the fabric of society and in our own lives.



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Appendix A: Tables and descriptions

Table 1 Free text replies of opinions on the plastic tax bag (percentage)

Description	Category	Type of reply	Percent (N)
Positive motives	Reduces the amount of plastic	"Reduces the use/amount of plastic in circulation" "Less consumption of plastic"	19 (252)
		"Reduces waste"	
	Behaviour changes	"More chooses other options"	13 (168)
		"Bring bag from home"	
		"Chooses paper/textile bag instead"	
	Raises awareness	"Makes you think"	7 (98)
		"Raises awareness on the problems surrounding plastic"	
	Pro-environmental policy	"Enables more environmental/sustainable alternatives"	3 (42)
	Favours more regulations	"Further tax increases wanted"	2 (27)
		"Taxation of more materials wanted"	
Negative motives		"Total ban on the plastic bag wanted"	
	Source of tax income	"Important source of income which enables/forces the development of other alternatives"	2 (23)
	Harmful material	"Plastic harms nature/wildlife"	2 (23)
		"Plastic litter"	
	Important signal value	"Important signal/symbol value/policy instrument"	1 (20)
	Ineffective/useless	"The tax is of marginal/no use for the environment"	16 (205)
		"Does not significantly affect plastic consumption"	
	The plastic bag is not the main problem	"The plastic bag is not problematic (in Sweden) as it is reused/recycled"	6 (84)
		"Other plastic packaging (more) problematic"	
	Creates worse alternative consumption	"Creates alternative consumption that is worse/equally bad for the environment"	5 (61)
	Not just a Swedish problem	"The problem is (mainly) not Swedish"	5 (60)
		"Bigger issue in other countries, not affected by the tax"	
	Pretext for tax revenue	"Pretext for increasing tax revenues"	3 (44)
	Political symbolism	"Bad symbolic policy"	3 (35)
	Disproportional responsibility	"Imposes incorrect/disproportionate responsibility on the individual"	1 (19)
		"Issue which requires solutions at the system level"	
	Likes plastic bags	"Likes plastic bags, now too expensive"	1 (11)
Others	Other	[Other replies]	11 (145)

Note: The question was "Why do you think that the plastic bag tax is [reply to previous question]?" Based on 1 317 replies, the percentage base consists of those who answered the question. The number of responses exceeds the number of respondents as up to three replies were allowed.

Table 2 Policy proposal description

	Policy Proposal	Abbreviation
Q60_2	Requirements for clear and uniform information on how to recycle/return plastic products	Standardised recycling information on plastic products
Q58_1	Requirement for all newly produced plastic products sold to be recyclable	Recyclable new plastic products
Q58_3	Give authorities directives to choose more sustainable alternatives to disposable plastic in public procurements	Green public procurements
Q58_6	Include more disposable packaging in the deposit-refund system	Extended deposit-refund system
Q56_1	Requirement for producers to use a certain proportion of bio-based or recycled plastic in production of new plastic products	Greening mass balance
Q60_3	Significantly increase the number of source-separated recycling bins in public places	Source separation of public waste bins
Q60_6	Provide state financial support for industrial projects aimed at more sustainable plastic production (e.g., bio-based plastic or plastic recycling)	State investments in green production
Q56_4	Ban on disposable plastic packaging where there are alternatives	Bans (on disposable packaging)
Q60_5	Give authorities directives to run information campaigns to inform citizens about more sustainable plastic consumption	Information campaigns
Q58_5	Adjustments of waste management fees after how well households sort their waste	Relative waste management fee
Q56_2	Requirement for public pension funds to avoid investments in companies with core business in fossil-based plastic production	Plastic divestments of public pensions
Q56_5	Impose tariffs so that imported fossil-based plastic to the EU becomes more expensive	Tariffs (on imported plastic)
Q60_4	Make it mandatory for grocery stores to offer consumers the opportunity to buy goods in bulk (e.g., dry goods)	Goods in bulk
Q60_1	Ban new production of all fossil-based plastic by 2030	Ban (fossil-based) plastic production by 2030
Q58_4	Give municipalities grants to start loaning services for plastic equipment (e.g., sports gear, toys, tools)	Municipal loaning services
Q56_6	Requirement for all stores that sell newly produced plastic products to offer repairs on them	Store repairs (on plastic products)
Q58_2	Impose tax on disposable plastic packaging	Tax on disposable packaging
Q56_3	Grocery stores should pay a fee for each disposable container which is not part of a deposit-refund system or not taken back by the store	Fees (for stores) on disposable packaging

Table 3 Textile policy proposal description

	Policy Proposal	Abbreviation
Q62_4	Decreased VAT on clothing repairs (e.g., tailoring and shoe repairs)	Decreased VAT on repairs
Q62_1	Introduce separate waste bins for clothes in garbage- and waste areas in apartment buildings	Separate clothing bins
Q62_3	Decreased VAT on sale of used clothes (second-hand)	Decreased VAT on second-hand
Q62_5	Introduce a deposit-refund system for clothes	Clothing deposit-refund system
Q62_2	Increased VAT on sales of newly produced clothes	Increased VAT (on new clothes)

Table 4 Description of measures to reduce negative environmental effects of plastic packaging

	Policy Measure	Abbreviation
Q64_4	More plastic packaging included in the deposit-refund system	Extended deposit-refund system
Q64_2	Subsidies for more sustainable alternatives to plastic packaging	Subsidies on more sustainable alternatives
Q64_9	More information and advice on how citizens should manage plastic packaging	More information and advice to consumers
Q64_7	Tougher requirements on retailers and companies to sell less plastic packaging	Tougher requirements on retail to sell less
Q64_6	Stricter regulations for companies that manufacture plastic packaging	Stricter regulations on manufacturers
Q64_3	That the environmental impact of plastic packaging is considered in the authorities' public procurements	Environmental consideration in public procurements
Q64_1	Higher taxation on plastic packaging	Higher taxation
Q64_5	Bans on more categories of plastic packaging	More bans
Q64_8	Tougher requirements for citizens to consume less packaging	Tougher requirements on consumers to buy less

Appendix B: The survey (Swedish)

Questionnaire for the survey: 'Sustainable Plastics and Transition Pathways'

Frågeformulär för enkätundersökningen: 'Sustainable Plastics and Transition Pathways'

DEL 1. GENERELLA ATTITYDER KRING PLAST

q38 Hur stort miljöproblem anser du att plast utgör?

- ☐ 1 Inte alls stort (1)
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7 Mycket stort (7)

q40 Vilka är enligt dig de största nackdelarna med plast?

Du kan välja högst tre svarsalternativ.

- ☐ Det förorenar naturen (1)
- ☐ Det återvinns i för liten utsträckning (2)
- ☐ Det används kortsiktigt som engångsmaterial (3)
- ☐ Det kan skada djur och natur (4)
- ☐ Det kan potentiellt påverka vår hälsa negativt (5)
- ☐ Det bryts inte ner lika lätt som naturliga material (6)
- ☐ Det tillverkas av fossila bränslen (7)
- ☐ Annat, nämligen: (8)

q42 Vilka är enligt dig de största fördelarna med plast?

Du kan välja högst tre svarsalternativ.

- ☐ Det är ett lätt material (1)
- ☐ Det kan användas till många olika saker (2)
- ☐ Det är ett material med lång livslängd (3)
- ☐ Det är ett billigt material (4)
- ☐ Det är ett hygieniskt material inom sjukvården (5)
- ☐ Det kan skydda livsmedel (6)
- ☐ Det är ett material vars produktion och användning skapar jobb och tillväxt (7)
- ☐ Annat, nämligen: (8)

q44 Givet plastens för- och nackdelar, är plast i huvudsak ett bra eller dåligt material enligt din mening?

- ☐ Mycket bra material
- ☐ Ganska bra material
- ☐ Varken bra eller dåligt material
- ☐ Ganska dåligt material
- ☐ Mycket dåligt material

q46 Vilka av dessa organisationer och grupper tycker du generellt sett bär störst ansvar för att hantera negativa miljöeffekter kopplade till plast?

Du kan välja högst tre svarsalternativ.

- ☐ Regeringen (1)
- ☐ Riksdagen (2)
- ☐ Myndigheter (3)
- ☐ Kommuner (4)
- ☐ Europeiska unionen (EU) (5)
- ☐ Förenta nationerna (FN) (6)
- ☐ Företag som tillverkar och säljer plastprodukter (7)
- ☐ Individer (8)
- ☐ Ideella föreningar (9)
- ☐ Annat, nämligen: (10)

q48 Av de tre organisationer och grupper du valde, vilka anser du bär störst, näst störst respektive tredje störst ansvar för att hantera negativa miljöeffekter kopplade till plast?

Rangordna de alternativ du angav i föregående fråga, där 1 betyder störst ansvar, 2 betyder näst störst ansvar och 3 betyder tredje störst ansvar av de alternativ du valt.

- _____ Regeringen (1)
- _____ Riksdagen (2)
- _____ Myndigheter (3)
- _____ Kommuner (4)
- _____ Europeiska unionen (EU) (5)
- _____ Förenta nationerna (FN) (6)
- _____ Företag som tillverkar och säljer plastprodukter (7)
- _____ Individer (8)
- _____ Ideella föreningar (9)
- _____ Annat, nämligen (10)

DEL 2. ATTITYDER TILL SKATTEN PÅ PLASTPÅSAR

q50 Vilken är din inställning till skatten på plastpåsar som infördes i Sverige den 1 maj 2020?

- ☐ Mycket positiv
☐ Ganska positiv
☐ Varken positiv eller negativ
☐ Ganska negativ
☐ Mycket negativ

q52 Varför tycker du att skatten på plastpåsar är [svar på q50]? (Fritextsvar)

.....

.....

.....

DEL 3. ATTITYDER TILL PLASTPOLICYS

q56 Nedan följer exempel på åtgärder som skulle kunna bidra till minskade negativa miljöeffekter kopplade till plast. Vad anser du om följande åtgärder?

(Randomiserat)

	Mycket bra förslag	Ganska bra förslag	Varken bra eller dåligt förslag	Ganska dåligt förslag	Mycket dåligt förslag
Krav på att producenter ska använda en viss andel biobaserad eller återvunnen plast i nyproduktion av plastprodukter (1)	○	○	○	○	○
Krav på att de statliga allmänna pensionsfonderna ska undvika investeringar i företag vars kärnverksamhet är fossilbaserad plastproduktion (2)	○	○	○	○	○
Matbutiker ska betala en avgift för varje engångsförpackning som inte ingår i ett pantsystem eller inte tas tillbaka av butik (3)	○	○	○	○	○
Förbud av engångsförpackningar av plast där det finns alternativ (4)	○	○	○	○	○
Att införa tullar så att importerad fossilbaserad plast till EU blir dyrare (5)	○	○	○	○	○
Krav på att alla butiker som säljer nyproducerade plastprodukter ska kunna erbjuda reparationsmöjligheter av samma produkter (6)	○	○	○	○	○

q58 Nedan följer exempel på åtgärder som skulle kunna bidra till minskade negativa miljöeffekter kopplade till plast. Vad anser du om följande åtgärder?

(Randomiserat)

	Mycket bra förslag	Ganska bra förslag	Varken bra eller dåligt förslag	Ganska dåligt förslag	Mycket dåligt förslag
Krav på att alla nyproducerade plastprodukter som säljs ska kunna återvinnas (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Beskatta engångsförpackningar av plast (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ge myndigheter direktiv att genom de offentliga upphandlingarna välja mer hållbara alternativ till engångsplast (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ge kommuner bidrag för att starta utlåningscentraler för lån av plastutrustning (t ex sporttillbehör, leksaker, verktyg) (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Att avgifterna för avfallshantering anpassas till hur väl hushållet/fastigheten sorterar sitt avfall (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inkludera fler engångsförpackningar i pantsystemet (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

q60 Nedan följer exempel på åtgärder som skulle kunna bidra till minskade negativa miljöeffekter kopplade till plast. Vad anser du om följande åtgärder?





(Randomiserat)

	Mycket bra förslag	Ganska bra förslag	Varken bra eller dåligt förslag	Ganska dåligt förslag	Mycket dåligt förslag
Förbjuda nyproduktion av all fossilbaserad plast till år 2030 (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Krav på tydlig och enhetlig information på plastprodukter om hur de ska återvinnas eller återlämnas (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kraftigt utöka antalet avfallskärl för återvinning av olika material på offentliga platser (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Göra det obligatoriskt för matbutiker att erbjuda konsumenter möjlighet att köpa varor i lösvikt (t ex torrvaror) (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ge myndigheter direktiv att driva informationskampanjer för att informera medborgare om en mer hållbar plastkonsumtion (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ge statligt ekonomiskt stöd till industriprojekt riktade åt mer hållbar plastproduktion (t ex biobaserad plast eller plaståtervinning) (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

DEL 4. ATTITYDER TILL TEXTILPOLICY

(kläder tillverkade av plast)

q62 Även en stor del av de kläder vi konsumerar är tillverkade av plast. Nedan följer exempel på åtgärder som skulle kunna bidra till minskade negativa miljöeffekter kopplade till kläder som är tillverkade av plast. Vad anser du om följande åtgärder?

	Mycket bra förslag	Ganska bra förslag	Varken bra eller dåligt förslag	Ganska dåligt förslag	Mycket dåligt förslag
Införa separata avfallskärl för kläder i soprum och avfallsrum i flerbostadshus (1)					
Högre moms på försäljning av nyproducerade kläder (2)					
Lägre moms på försäljning av begagnade kläder (second hand) (3)					
Lägre moms på reparation av kläder (t ex skrädderi och skomakeri) (4)					
Införa ett pantsystem för kläder (5)					

DEL 5. ATTITYDER TILL EFFEKTIVITET AV POLICYTYP

(plastförpackningar)

q64 Vilka av följande åtgärder tror du är mest effektiva för att minska negativa miljöeffekter kopplade till plastförpackningar?

Du kan välja högst tre svarsalternativ.

- ☐ Högre beskattning av plastförpackningar (1)
- ☐ Subventioner av mer hållbara alternativ till plastförpackningar (2)
- ☐ Att plastförpackningars miljöpåverkan tas i beaktande i myndigheternas offentliga upphandlingar (3)
- ☐ Pant på fler plastförpackningar (4)
- ☐ Förbud av fler plastförpackningar (5)
- ☐ Striktare regleringar av företag som tillverkar plastförpackningar (6)
- ☐ Hårdare krav på handeln och företag att sälja färre plastförpackningar (7)
- ☐ Hårdare krav på medborgare att konsumera färre plastförpackningar (8)
- ☐ Mer information och råd om hur medborgare bör hantera plastförpackningar (9)

STEPS goal is to facilitate this transition by sharing innovation, knowledge and findings between academia, industry and society. STEPS partners include Lund University, University of Copenhagen, RISE IVF, IVL, 21 industrial partners and County council of Scania county of Sweden representing the entire value chains in a sustainable plastics system.

STEPS is looking for sustainable solutions throughout the value chain from renewable feedstock, conversion and design to post-consumer plastic waste handling. STEPS concept is to design sustainable plastics with desired material properties and life-cycle by matching suitable carbon-neutral building blocks.

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